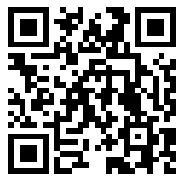
This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

Google™ books

https://books.google.com



CORNELL
UNIVERSITY
LIBRARY



FROM

The Supt. of Documents

[redacted]

Digitized by Google

Date Due

BASEMENT STORAGE

CORNELL UNIVERSITY LIBRARY
3 1924 057 263 224

Digitized by Google

CORNELL
UNIVERSITY
LIBRARY

Digitized by Google

Digitized by Google

A721008
36

Transf. to Dup.
22/XI/63

Digitized by Google

OFFICERS AND COMMITTEES

OFFICERS

Honorary president, SAMUEL W. STRATTON, chairman of the executive committee, Massachusetts Institute of Technology, Cambridge, Mass., and former Director of the Bureau of Standards, Washington, D. C.

(Serving during twenty-third national conference)

President, GEORGE K. BURGESS, Director, Bureau of Standards, Washington, D. C.
First vice president, FRANCIS MEREDITH, director, State division of standards, Boston, Mass.
Second vice president, HOWARD S. JARRETT, State commissioner of weights and measures, Charleston, W. Va.
Secretary, F. S. HOLBROOK, Bureau of Standards, Washington, D. C.
Treasurer, GEORGE F. AUSTIN, sealer of weights and measures, Detroit, Mich.

(As elected by twenty-third national conference for the ensuing year)

President, GEORGE K. BURGESS, Director, Bureau of Standards, Washington, D. C.
First vice president, HOWARD S. JARRETT, State commissioner of weights and measures, Charleston, W. Va.
Second vice president, ALBERT B. SMITH, director, State bureau of standard weights and measures, Harrisburg, Pa.
Secretary, F. S. HOLBROOK, Bureau of Standards, Washington, D. C.
Treasurer, GEORGE F. AUSTIN, Jr., assistant supervisor, bureau of weights and measures, Detroit, Mich.

COMMITTEES

EXECUTIVE COMMITTEE

(As elected by twenty-third national conference)

GEORGE K. BURGESS
HOWARD S. JARRETT
ALBERT B. SMITH
F. S. HOLBROOK
GEORGE F. AUSTIN, Jr.
} *Ex officio.*

WILLIAM F. CLUETT, chief deputy inspector of weights and measures, Chicago, Ill.
E. J. CROUCH, director, State bureau of weights and measures, Boise, Idaho.
H. N. DAVIS, deputy State commissioner of weights and measures, Montpelier, Vt.
C. V. FICKETT, sealer of weights and measures, Portland, Me.
THOMAS FLAHERTY, city and county sealer of weights and measures, San Francisco, Calif.
J. HARRY FOLEY, State superintendent of weights and measures, Trenton, N. J.
WILLIAM FOSTER, sealer of weights and measures, Springfield, Mass.
WILLIAM A. GRAHAM, State commissioner of agriculture, Raleigh, N. C.
S. T. GRIFFITH, chief, division of weights and measures, Baltimore, Md.
T. F. MAHONEY, sealer of weights and measures, Chattanooga, Tenn.
EDWARD J. MARONEY, sealer of weights and measures, New Haven, Conn.
I. L. MILLER, State commissioner of weights and measures, Indianapolis, Ind.
C. R. MCFADDEN, sealer of weights and measures of Licking County, Pataskala, Ohio.
WILLIAM A. PAYNE, sealer of weights and measures of Monroe County, Rochester, N. Y.
B. W. RAGLAND, chief, bureau of weights and measures, Richmond, Va.
GEORGE M. ROBERTS, superintendent of weights, measures, and markets, Washington, D. C.
WILLIAM F. STEINEL, sealer of weights and measures, Milwaukee, Wis.
V. A. STOVALL, chief State inspector of weights and measures, Austin, Tex.
HAROLD A. WEBSTER, State commissioner of weights and measures, Concord, N. H.
S. H. WILSON, State oil chemist, Atlanta, Ga.

Digitized by Google

COMMITTEE ON SPECIFICATIONS AND TOLERANCES

(Standing committee)

F. S. HOLBROOK, Bureau of Standards, Washington, D. C.
WILLIAM F. CLUETT, chief deputy inspector of weights and measures, Chicago, Ill.
CHARLES M. FULLER, city and county sealer of weights and measures, Los Angeles, Calif.
A. W. SCHWARTZ, assistant State superintendent of weights and measures, Elizabeth, N. J.
I. L. MILLER, State commissioner of weights and measures, Indianapolis, Ind.

COMMITTEE ON UNIFORMITY IN WEIGHTS AND MEASURES REQUIREMENTS

(Standing committee)

J. H. MEEK, director State division of markets, Richmond, Va.
P. D. DUKESHERER, director State bureau of foods and standards, Lansing, Mich.
D. E. FITZGERALD, sealer of weights and measures, Racine, Wis.
PHILIP T. PILON, State inspector of weights and measures, Hartford, Conn.
ALBERT B. SMITH, director State bureau of standard weights and measures, Harrisburg, Pa.
C. P. SMITH, sealer of weights and measures of Suffolk County, Riverhead, N. Y.
V. A. STOVALL, chief State inspector of weights and measures, Austin, Tex.

ACTING COMMITTEES FOR THE TWENTY-THIRD NATIONAL CONFERENCE

Committee on resolutions.—A. B. SMITH, P. D. DUKESHERER, J. H. FOLEY, S. H. WILSON, THOMAS FLAHERTY, S. T. GRIFFITH, J. A. SWEENEY.
Committee on nominations.—FRANCIS MEREDITH, I. L. MILLER, GEORGE WARNER, W. A. PAYNE, B. W. RAGLAND.

OFFICIAL STENOGRAPHER

NORMAN L. KNAUSS, Bureau of Standards, Washington, D. C.

Digitized by Google

LIST OF PERSONS ATTENDING THE CONFERENCE

DELEGATES—STATE, COUNTY, AND CITY OFFICIALS

ALABAMA

City: Birmingham — R. C. SHARP, chief inspector of weights and measures, room 200, City Hall.

CALIFORNIA

City and County:
- Los Angeles — CHARLES M. FULLER, sealer of weights and measures, 230 Court Street, Los Angeles.
- San Francisco — THOMAS FLAHERTY, sealer of weights and measures, room 6, City Hall, San Francisco.

CONNECTICUT

State — PHILIP T. PILON, inspector of weights and measures, 100 Washington Street, Hartford.

City:
- Bridgeport — DENNIS KELLY, sealer of weights and measures.
- Hartford — LOUIS ELSNER, sealer of weights and measures, 550 Main Street.
- New Haven — EDWARD J. MARONEY, sealer of weights and measures, City Hall.

County:
- Fairfield — WILLIAM H. BROWN, sealer of weights and measures, County Courthouse, Bridgeport.
- Hartford — MILO C. GRIFFIN, sealer of weights and measures, 95 Washington Street, Hartford.
- Middlesex — G. ERNEST HUBBARD, sealer of weights and measures, Middletown.
- New Haven — WILLIAM P. TYLER, sealer of weights and measures, County Courthouse, New Haven.

DELAWARE

County: Sussex — DALLAS M. ROGERS, regulator of weights and measures, Georgetown.

DISTRICT OF COLUMBIA

District — W. C. DILLER, chief inspector of weights, measures, and markets, District Building, Washington.
GEORGE A. HOWE, inspector of weights, measures, and markets, District Building, Washington.
G. STUART REEDER, inspector of weights, measures, and markets, District Building, Washington.

GEORGIA

State — S. H. WILSON, State oil chemist, room 37, State Capitol, Atlanta.

IDAHO

State — ERNEST J. CROUCH, director bureau of weights and measures, room 108, Statehouse, Boise.

Digitized by Google

ILLINOIS

State—W. T. Fossett, superintendent of standards, room 214, State Capitol, Springfield.
Mrs. Ethel Pass, secretary to superintendent of standards, room 214, State Capitol, Springfield.

INDIANA

State—I. L. Miller, commissioner of weights and measures, room 201, Statehouse Annex, Indianapolis.
City: South Bend—Charles J. Burns, inspector of weights and measures, City Hall.
County: Huntington—DeForest McLin, sealer of weights and measures, Huntington.

KENTUCKY

City: Louisville—E. F. Knauer, chief inspector of weights and measures, City Hall.

MAINE

City:
Portland—C. V. Fickett, sealer of weights and measures, City Building.
Skowhegan—Joseph H. Murray, sealer of weights and measures.
Waterville—William A. Jones, sealer of weights and measures.

MARYLAND

City: Baltimore—S. T. Griffith, chief, division of weights and measures, City Hall.
William A. Clubb, inspector of weights and measures, City Hall.
Charles G. Crockett, inspector of weights and measures, City Hall.
James T. Everett, inspector of weights and measures, City Hall.
William H. Larrimore, inspector of weights and measures, City Hall.
George H. Leithauser, inspector of weights and measures, City Hall.
Thomas J. Napfel, inspector of weights and measures, City Hall.
Elmer S. Pierpont, inspector of weights and measures, City Hall.
Charles Rusteberg, inspector of weights and measures, City Hall.
Henry Slitzer, assistant inspector of weights and measures, City Hall.
Charles Zuschlag, inspector of weights and measures, City Hall.

MASSACHUSETTS

State—Francis Meredith, director of standards, room 194, Statehouse, Boston.
Adelbert L. Jones, inspector of standards, room 194, Statehouse, Boston.

City:
Arlington—Allan E. Cowie, sealer of weights and measures, Town Hall.
Boston—James A. Sweeney, sealer of weights and measures, City Hall Annex.
Springfield—William Foster, sealer of weights and measures, room 9, Administration Building.
Worcester—Homer J. Melidy, deputy sealer of weights and measures, City Hall.

Digitized by Google

MICHIGAN

State	PETER D. DUKESHERER, director, bureau of foods and standards, Lansing.
City: Detroit	GEORGE F. AUSTIN, Jr., assistant supervisor, bureau of weights and measures, 1300 Beaubien Street.
City and County: Saginaw	GEORGE W. MAHN, sealer of weights and measures, City Hall, Saginaw.

NEW HAMPSHIRE

City: Manchester	ARTHUR J. PROVENCHER, sealer of weights and measures.

NEW JERSEY

State	J. HARRY FOLEY, superintendent of weights and measures, Trenton.
	ELLIOTT B. HOLTON, assistant superintendent of weights and measures, Trenton.
	HARRY S. PROVOST, assistant superintendent of weights and measures, Trenton.
	JOSEPH G. ROGERS, assistant superintendent of weights and measures, Trenton.
	A. W. SCHWARTZ, assistant superintendent of weights and measures, Elizabeth.
City:	
Bayonne	WALTER J. FLYNN, superintendent of weights and measures, Municipal Building.
Elizabeth	WILLIAM J. BENDER, superintendent of weights and measures, Harmonia Building.
Englewood	JAMES E. FITZGERALD, superintendent of weights and measures, City Hall.
Jersey City	JOHN S. BURKE, superintendent of weights and measures, City Hall.
Kearny	JOHN D. CASTLES, superintendent of weights and measures, Town Hall.
Newark	PATRICK J. CAUFIELD, superintendent of weights and measures, City Hall.
Trenton	FRANCIS J. BLACK, superintendent of weights and measures, City Hall.
County:	
Bergen	A. F. BARNARD, superintendent of weights and measures, 29 Main Street, Hackensack.
Cape May	GILBERT S. SMITH, superintendent of weights and measures, Avalon.
Gloucester	WILLIAM P. ABDILL, superintendent of weights and measures, Woodbury.
Hudson	THOMAS J. WALDRON, superintendent of weights and measures, Courthouse, Jersey City.
Mercer	RALPH M. BODENWIESER, superintendent of weights and measures, Courthouse, Trenton.
Middlesex	JOSEPH FERTIG, superintendent of weights and measures, 184 Livingston Avenue, New Brunswick.
Monmouth	ROBERT M. MARKS, assistant superintendent of weights and measures, Manasquan.
Morris	HENRY S. WORMAN, superintendent of weights and measures, Boonton.
Sussex	R. LEE SLATER, superintendent of weights and measures, Newton.
Union	ISAAC SEELEY, superintendent of weights and measures, Courthouse, Elizabeth.

Digitized by Google

NEW YORK

State	C. P. NORGORD, assistant commissioner of agriculture and markets, Albany.
City: Rochester	J. H. STEPHENSON, sealer of weights and measures.
County:	
Allegany	ALLEN W. CORWIN, sealer of weights and measures, 21 Osborn Street, Wellsville.
Monroe	W. A. PAYNE, sealer of weights and measures, 305 Terminal Building, Rochester.
	H. W. SHERMAN, deputy sealer of weights and measures, 305 Terminal Building, Rochester.
Rockland	THOMAS L. SHANKEY, sealer of weights and measures, Haverstraw.
Suffolk	C. P. SMITH, sealer of weights and measures, Riverhead.

NORTH CAROLINA

State	WILLIAM H. RICHARDSON, editor, department of agriculture, Raleigh.

OHIO

State	J. C. TINKEY, deputy sealer of weights and measures, Columbus.
City: Cleveland	G. A. VOTAW, commissioner of markets, weights, and measures.
County: Licking	C. R. MCFADDEN, deputy sealer of weights and measures, Pataskala.

PENNSYLVANIA

State	ALBERT B. SMITH, director bureau of standard weights and measures, Harrisburg.
	OSCAR B. BAKER, assistant director, bureau of standard weights and measures, Harrisburg.
City:	
Philadelphia	CONYERS B. GRAHAM, chief clerk, bureau of weights and measures, room 305, City Hall.
	WOODWARD ABRAHAMS, district supervisor, bureau of weights and measures, room 305, City Hall.
	JACOB M. VANDERSLICE, district supervisor, bureau of weights and measures, room 305, City Hall.
	CHARLES C. MILLER, inspector, bureau of weights and measures, room 305, City Hall.
York	D. L. STOUCH, inspector of weights and measures, 460 West Market Street.
County:	
Allegheny	THOMAS L. HOWARD, chief inspector of weights and measures, Courthouse, Pittsburgh.
Dauphin	JOHN E. BOWERS, inspector of weights and measures, 13 South Third Street, Harrisburg.
Lehigh	HARRY E. BIERY, inspector of weights and measures, Courthouse, Allentown.
City and County:	
Beaver Falls and Beaver County.	CHESTER RIMBY, inspector of weights and measures, Beaver Falls.
Easton and Northampton County.	JOHN J. WEPPEL, inspector of weights and measures, Courthouse, Easton.

RHODE ISLAND

City: Providence	LOUIS B. JONES, superintendent of weights and measures.

Digitized by Google

TENNESSEE

City: Chattanooga — T. F. MAHONEY, sealer of weights and measures, City Hall.

TEXAS

State — V. A. STOVALL, chief inspector of weights and measures, Austin.

UTAH

City: Salt Lake City — B. D. NEBEKER, superintendent of weights and measures and oil inspection, Safety Building.

VERMONT

State — C. R. WHITE, commissioner of weights and measures, Montpelier.
H. N. DAVIS, deputy commissioner of weights and measures, Montpelier.

VIRGINIA

State — J. H. MEEK, director division of markets, 1030 State Office Building, Richmond.
H. G. COVILLE, field representative, division of markets, 1030 State Office Building, Richmond.

City:
Charlottesville — R. E. HALL, Jr., sealer of weights and measures, City Hall.
Danville — GEORGE S. DYER, sealer of weights and measures.
Richmond — B. W. RAGLAND, chief, bureau of weights and measures, 314 City Hall Annex.

WEST VIRGINIA

State — HOWARD S. JARRETT, commissioner of weights and measures, Charleston.
P. R. EDLER, inspector of weights and measures, Charleston.
P. T. SULLIVAN, inspector of weights and measures, 1110 Fifth Street, Moundsville.

WISCONSIN

State — GEORGE W. WARNER, chief inspector of weights and measures, Capitol Building, Madison.

City:
Milwaukee — WILLIAM F. STEINEL, sealer of weights and measures, 421 Fifth Street.
West Allis — ERWIN J. ROGERS, sealer of weights and measures.

OTHER DELEGATES, AND GUESTS APPEARING ON THE PROGRAM

BARRETT, HERBERT F., assistant sales manager, Buffalo Meter Co., 2917 Main Street, Buffalo, N. Y.
BEAN, H. S., Bureau of Standards, Washington, D. C.
BEARCE, H. W., Bureau of Standards, Washington, D. C.
BLANCHARD, R. K., vice president Neptune Meter Co., 50 East Forty-second Street, New York, N. Y.
BURGESS, Dr. GEORGE K., Director Bureau of Standards, Washington, D. C.
CURTIS, W. H., research engineer, National Recording Pump Co., Dayton, Ohio.
DARTT, CARL E., president Columbia Scale Co., 634–644 Whitlock Avenue, New York, N. Y.
GOULD, R. E., Bureau of Standards, Washington, D. C.

Digitized by Google

GRIFFITH, C. P., engineer, S. F. Bowser & Co. (Inc.), Fort Wayne, Ind.
HADLICK, PAUL E., secretary, division of marketing, American Petroleum Institute, 250 Park Avenue, New York, N. Y.
HARRISON, M. J. J., chairman committee on specifications, National Scale Men's Association, Union Station, Chicago, Ill.
HITZEMAN, A. P., chief engineer The Wayne Co., Fort Wayne, Ind.
HOLBROOK, F. S., Bureau of Standards, Washington, D. C.
HUBBARD, H. D., Bureau of Standards, Washington, D. C.
JUDSON, L. V., Bureau of Standards, Washington, D. C.
KLEIN, Hon. JULIUS, Assistant Secretary of Commerce, Washington, D. C.
LOHMANN, HENRY, National Association of Retail Grocers, 8614 Ninety-first Avenue, Woodhaven, N. Y.
MACLEAN, ALLEN D., chief engineer Pittsburg Equitable Meter Co., 400 North Lexington Avenue, Pittsburgh, Pa.
MILLER, D. R., Bureau of Standards, Washington, D. C.
PALMER, ARTHUR W., chief, division of cotton marketing, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.
PARRY, WILLIAM, Bureau of Standards, Washington, D. C.
PEFFER, E. L., Bureau of Standards, Washington, D. C.
PERKINS, Hon. RANDOLPH, chairman Committee on Coinage, Weights, and Measures, House of Representatives, Washington, D. C.
PIENKOWSKY, A. T., Bureau of Standards, Washington, D. C.
RICHARD, C. L., Bureau of Standards Master Scale Depot, Clearing Station, Chicago, Ill.
ROESER, H. M., Bureau of Standards Master Scale Depot, Clearing Station, Chicago, Ill.
SMITH, RALPH W., Bureau of Standards, Washington, D. C.
SPILMAN, H. A., senior marketing specialist, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.
SOUDER, WILMER, Bureau of Standards, Washington, D. C.
WARD, ROBERT J., gasoline meter division, Worthington Pump & Machinery Corporation, Harrison, N. J.

GUESTS REPRESENTING MANUFACTURERS

Becker, Christian (Inc.): C. A. BECKER, 147 Eight Street, Jersey City, N. J.
Black & Decker Manufacturing Co.: E. E. POWELL, traffic engineer, Towson, Md.
Bowser, S. F., & Co. (Inc.):
DAN. G. MILLIGAN, vice president, Fort Wayne, Ind.
C. P. GRIFFITH, engineer, Fort Wayne, Ind.
Buffalo Meter Co.: HERBERT F. BARRETT, assistant sales manager, 2917 Main Street, Buffalo, N. Y.
Chatillon, John, & Sons:
P. T. BORTELL, sales manager, 89 Cliff Street, New York, N. Y.
W. T. HAYDOCK, 89 Cliff Street, New York, N. Y.
J. GEORGE HUGEL, 89 Cliff Street, New York, N. Y.
Columbia Scale Co. (Inc.): CARL E. DARTT, president, 634–644 Whitlock Avenue, New York, N. Y.
Continental Scale Works: M. J. WEBER, vice president, 5701 South Claremont Avenue, Chicago, Ill.
Davis Welding & Manufacturing Co.: E. W. SCHUTTE, secretary-treasurer, Cincinnati, Ohio.
Dayton Pump & Manufacturing Co.: C. C. HELLER, service manager, 500 Webster Street, Dayton, Ohio.
Dover Stamping & Manufacturing Co.: LOUIS S. CLEAVES, vice president, 385 Putnam Avenue, Cambridge, Mass.
Erie Meter Systems (Inc.): G. W. MCDOUGALL, sales manager, Erie, Pa.
Exact Weight Scale Co.: JOHN G. SIMS, vice president, 944 West Fifth Avenue, Columbus, Ohio.
Fairbanks, Morse & Co.:
H. L. HILLEARY, district manager, railroad division, 160 Varick Street, New York, N. Y.
E. P. VROOME, sales engineer, 160 Varick Street, New York, N. Y.
C. A. HENNIE, scale department manager, 115 East Lombard Street, Baltimore, Md.

Digitized by Google

Gilbert & Barker Manufacturing Co.:
J. A. LOGAN, chief engineer, Springfield, Mass.
G. C. ROBERTS, general sales manager, Springfield, Mass.
H. W. LIPMAN, salesman, Springfield, Mass.
Gray Co., The: HARRY D. SMITH, 2401 Chestnut Street, Philadelphia, Pa.
Gurley, W. & L. E.: W. L. EGY, engineer, 514 Fulton Street, Troy, N. Y.
Hollingshead, R. M., Co.:
R. M. BAGLEY, vice president, Camden, N. J.
LESLIE A. THOMPSON, railroad sales manager, Camden, N. J.
Howe Scale Co.: C. A. LINDSAY, branch manager, 415 Arch Street, Philadelphia, Pa.
International Business Machines Corporation:
S. M. TEMPLETON, vice president, Dayton Scale Co. division, Dayton, Ohio.
U. RAIFF, chain-store manager, Dayton Scale Co. division, 270 Broadway, New York, N. Y.
HARRY S. EVANS, Washington manager, 816 Fourteenth Street, Washington, D. C.
W. G. EGERTON, Washington manager, Dayton Scale Co. division, 816 Fourteenth Street, Washington, D. C.
Jacobs Bros. Co. (Inc.):
H. M. JACOBS, secretary-treasurer, 32 Walton Street, Brooklyn, N. Y.
CHARLES RICHARD BRODY, assistant general manager, 32 Walton Street, Brooklyn, N. Y.
J. E. WOODLAND, sales manager, detectogram division, 32 Walton Street, Brooklyn, N. Y.
Kellogg Manufacturing Co.: J. K. GILCHRIST, sales-promotion manager, 97 Humboldt Street, Rochester, N. Y.
L N S Corporation:
A. A. HODGKINS, 71 Murray Street, New York, N. Y.
BJORNULF JOHNSEN, mechanical engineer, 71 Murray Street, New York, N. Y.
Logan Allington Co.: E. W. ALLINGTON, secretary, 135 East Forty-second Street, New York, N. Y.
Mathewson Machine Works: W. B. MATHEWSON, Quincy, Mass.
Measuregraph Co.: E. A. POWELL, service manager, 3905 Belle Avenue, Baltimore, Md.
Moore & Kling (Inc.): ELMER M. KLING, Boston, Mass.
National Pipe Products Corporation:
W. S. TOWNSEND, chairman board of directors, Rochester, Pa.
LYON MCCANDLESS, Rochester, Pa.
National Recording Pump Co.: W. H. CURTIS, research engineer, Dayton, Ohio.
Neptune Meter Co.:
R. K. BLANCHARD, vice president, 50 East Forty-second Street, New York, N. Y.
F. R. GAMMON, sales engineer, 50 East Forty-second Street, New York, N. Y.
Ohmer Fare Register Co.:
ROBERT B. ALEXANDER, branch manager, 1632 Fourteenth Street, Washington, D. C.
B. C. PALMER, sales engineer, New York, N. Y.
Oil Station Engineering Co.: HARRY D. SMITH, president, 2401 Chestnut Street, Philadelphia, Pa.
Peerless Weighing Machine Co.: E. M. SCHIEMER, district manager, 245 Fifth Avenue, New York, N. Y.
Pittsburgh Equitable Meter Co.:
ALLEN D. MACLEAN, chief engineer, 400 North Lexington Avenue, Pittsburgh, Pa.
H. I. BEARDSLEY, manager, oil and gasoline meter division, 400 North Lexington Avenue, Pittsburgh, Pa.
HORACE CHRISMAN, engineer, 400 North Lexington Avenue, Pittsburgh, Pa.
Roy Manufacturing Co.: FRANK J. OLDFIELD, vice president, 230 Water Street, Quincy, Mass.
St. Louis Pump & Equipment Co.: HARRY D. SMITH, 2401 Chestnut Street, Philadelphia, Pa.
Sanitary Scale Co.: ANSON G. SENER, vice president, 11 West Forty-second Street, New York, N. Y.
Seederer-Kohlbusch (Inc.): EDWIN C. SMITH, sales manager, 149 New York Avenue, Jersey City, N. J.

Digitized by Google

Seraphin Manufacturing Co.: THEO. A. SERAPHIN, president, 1314 North Seventh Street, Philadelphia, Pa.
Service Station Equipment Co.:
C. E. WEAVER, manager, gasoline pump division, room 302, 32 Broadway, New York, N. Y.
F. O. SALLEE, division manager, 1002 American Building, Baltimore, Md.
Sexton Can Co.: FRANK A. JOHNSON, salesman, Boston, Mass.
Standard Computing Scale Co.: W. TOM WHITE, factory representative, 2461 East Grand Boulevard, Detroit, Mich.
Tokheim Oil Tank & Pump Co.:
M. B. MUXEN, president, Fort Wayne, Ind.
CHESTER C. OBERLY, sales manager, Fort Wayne, Ind.
R. E. LANGSTON, engineer, Fort Wayne, Ind.
W. M. FRAZIER, district manager, Baltimore, Md.
Toledo Scale Co.: C. C. NEALE, special representative, Toledo, Ohio.
Torsion Balance Co.: A. T. MILLROY, 92 Reade Street, New York, N. Y.
Triner Scale & Manufacturing Co.: J. M. TRINER, president and treasurer, 2714 West Twenty-first Street, Chicago, Ill.
Universal Lubricating Devices (Inc.):
RICHARD BETZ, service manager, 597 Butler Street, Pittsburgh, Pa.
E. A. LUSHER, factory representative, 597 Butler Street, Pittsburgh, Pa.
Universal Pump & Tank Corporation:
F. CHARLTON, president, 3860 East Ninety-first Street, Cleveland, Ohio.
C. SPAETH, 3860 East Ninety-first Street, Cleveland, Ohio.
Veeder Root (Inc.): L. W. STEVENS, factory superintendent, Hartford, Conn.
Wayne Co., The:
A. D. CARRIGER, vice president, 1780 Broadway, New York, N. Y.
A. P. HITZEMAN, chief engineer, Fort Wayne, Ind.
R. A. DEMPSEY, district manager, 624 South Michigan Avenue, Chicago, Ill.
C. B. HARWELL, district manager, Philadelphia, Pa.
M. C. BROWN, 1414 Girard Street, NE., Washington, D. C.
Worthington Pump & Machinery Corporation: ROBERT J. WARD, gasoline meter division, Harrison, N. J.

GUESTS REPRESENTING TRADE ASSOCIATIONS

American Petroleum Institute:
PAUL E. HADLICK, secretary, division of marketing, 250 Park Avenue, New York, N. Y.
DAVID V. STROOP, engineer, 250 Park Avenue, New York, N. Y.
National Association of Retail Grocers: HENRY LOHMANN, 8614 Ninety-first Avenue, Woodhaven, N. Y.

GUESTS REPRESENTING RAILROADS AND WEIGHING DEPARTMENTS

DEAN, T. O., superintendent of scales, Texas & Pacific Railway, Dallas, Tex.
DUGAN, J. W., chief, weighing bureau, St. Louis-San Francisco Railroad, Springfield, Mo.
ECKER, GEORGE M., scale inspector, Central Railroad of New Jersey, Mauch Chunk, Pa.
EPRIGHT, A. W., superintendent scales and weighing, Pennsylvania Railroad, Altoona, Pa.
GOE, R. B., supervisor weighing and inspection, Illinois Central Railroad, Chicago, Ill.
HARRISON, M. J. J., general scale inspector, Pennsylvania Railroad, Chicago, Ill.
HICKS, B. L., supervisor of weights, Western Weighing and Inspection Bureau, 1800 Transportation Building, Chicago, Ill.
HOSFORD, C. C., general scale inspector, Pennsylvania Railroad, Pittsburgh, Pa.
KLOTZ, WILLIAM G., superintendent of scales, Missouri Pacific Lines of Texas, 204 Union Station, Houston, Tex.
LADD, M. H., chief weigher, Milwaukee Chamber of Commerce, Milwaukee, Wis.
LAWRENCE, E. KENT, general scale inspector, Baltimore & Ohio Railroad, Baltimore, Md.
MANN, C. H., superintendent of scales, Southern Railway System, Washington, D. C.

Digitized by Google

McKAY, W. M., scale inspector, Missouri Pacific Railroad, St. Louis, Mo.
PETTIS, C., general scale inspector, New York Central Railroad, Rochester, N. Y.
PHERIGO, J. L., chief scale inspector, Southern Railway, McPherson Square, Washington, D. C.
SCHLINKERT, F. H., superintendent of scales, Missouri Pacific Railroad, 1200 Missouri Pacific Building, St. Louis, Mo.
WELSH, ROBERT C., general scale inspector, Pennsylvania Railroad, Harrisburg, Pa.

GUESTS REPRESENTING GOVERNMENT DEPARTMENTS

BRIGGS, C. A., livestock weight supervisor, Bureau of Animal Industry, United States Department of Agriculture, Washington, D. C.
DE MAYOLA, ERNEST A., Bureau of Public Roads, United States Department of Agriculture, Washington, D. C.
GERDES, FRANCIS L., junior agricultural economist, United States Department of Agriculture, 300 Linworth Place SW., Washington, D. C.
SPILMAN, H. A., senior marketing specialist, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.
PALMER, ARTHUR W., chief, division of cotton marketing, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.

OTHER GUESTS

BAKER, B. E., Standard Oil Co. of New York, 230 Park Avenue, New York, N. Y.
FRENCH, G., Sinclair Refining Co., 45 Nassau Street, New York, N. Y.
JACOBS, EDITH G., secretary Scale Journal Publishing Co., 309 South LaSalle Street, Chicago, Ill.
KERNS, F. C., superintendent lubricating sales, The Texas Co., 135 East Forty-second Street, New York, N. Y.
LYONS, JOHN F., supervisor weights and measures department, American Stores Co., 419 North Nineteenth Street, Philadelphia, Pa.
MACDERMOTT, F. N., sales department, Atlantic Refining Co., 260 South Broad Street, Philadelphia, Pa.
MALONE, H. B., director of purchases Sinclair Refining Co., 45 Nassau Street, New York, N. Y.
MARCHANT, HARRY, scale inspector, Bethlehem Steel Co., Sparrows Point, Md.
MORRIS, HOMER I., Sun Oil Co., 1608 Walnut Street, Philadelphia, Pa.
ROUND, GEORGE A., assistant chief, engineering division, Vacuum Oil Co., 61 Broadway, New York, N. Y.
RUSSELL, SAMUEL, 109 First Street NE., Washington, D. C.
SAYBOLT, J. W., sales manager Standard Oil Co. of New Jersey, 26 Broadway, New York, N. Y.
TALIAFERRO, LINDSAY C., service-station department, Standard Oil Co. of New Jersey, Standard Oil Building, Baltimore, Md.

Digitized by Google

CONTENTS

First Session (Morning of Tuesday, June 3, 1930)

	Page
Opening address by the president, Dr. George K. Burgess	1
Abstracts of State reports:	
Alabama, R. C. Sharp	8
California, J. S. Casey	8
Connecticut, Philip T. Pilon	9
Delaware	9
District of Columbia	9
Georgia, S. H. Wilson	9
Idaho, Ernest J. Crouch	9
Illinois, W. T. Fossett	9
Indiana, I. L. Miller	10
Kentucky	10
Maine	10
Maryland, S. T. Griffith	10
Massachusetts, Francis Meredith	11
Michigan, Peter D. Dukesherer	11
New Hampshire	11
New Jersey, J. Harry Foley	11
New York, C. P. Norgord	11
North Carolina, William H. Richardson	12
Ohio, J. C. Tinkey	12
Pennsylvania, Albert B. Smith	12
Rhode Island, Louis B. Jones	12
Tennessee, T. F. Mahoney	13
Texas, V. A. Stovall	13
Utah, B. D. Nebeker	13
Announcement and motion	13

Second Session (Afternoon of Tuesday, June 3, 1930)

Abstracts of State reports—Continued:	
Vermont, H. N. Davis	14
Virginia, J. H. Meek	14
West Virginia, Howard S. Jarrett	14
Wisconsin, George Warner	15
Abstracts of reports of representatives of State associations of weights and measures officials:	
Indiana Association of Inspectors of Weights and Measures, I. L. Miller	15
Massachusetts Association of Sealers of Weights and Measures, Homer J. Melidy	15
Michigan State, County, and City Sealers' Association, George W. Mahn	15
New Jersey Weights and Measures Association, Joseph G. Rogers	15
New York State Association of Sealers of Weights and Measures, J. H. Stephenson	16
Ohio Sealers' Association, J. C. Tinkey	16
Notes on grease-measuring devices, by Ralph W. Smith, Bureau of Standards	16
Discussion of above paper	21
The sale of cotton by net weight and the standardization of the bale, by Arthur W. Palmer, chief, division of cotton marketing, Bureau of Agricultural Economics, United States Department of Agriculture	22
Discussion of above paper	28

Digitized by Google

Page

Cooperation with weights and measures officials, by Paul E. Hadlick, representing the American Petroleum Institute 29
Discussion of above paper 32
Report of committee on specifications and tolerances on modification of specifications for grease-measuring devices, presented by F. S. Holbrook, chairman 41

Third Session (Morning of Wednesday, June 4, 1930)

Report of committee on specifications and tolerances on specifications and tolerances for odometers, presented by F. S. Holbrook, chairman .. 43
Discussion of above report 44
Address by the chairman of the Committee on Coinage, Weights, and Measures, House of Representatives, Hon. Randolph Perkins 46
Some observations on weights and measures administration, by C. P. Norgord, assistant commissioner of agriculture and markets, State of New York 48
The standard container act of 1928, by H. A. Spilman, senior marketing specialist, Bureau of Agricultural Economics, United States Department of Agriculture 53
Address by the Assistant Secretary of Commerce, Hon. Julius Klein 57
Fixing of effective date of specifications and tolerances for grease-measuring devices 63
Discussion of paper on standard container act of 1928 65
Appointment of committees 65
The sale of chemically treated coal, by I. L. Miller, commissioner of weights and measures, State of Indiana 66
The retail grocer, by Henry Lohmann, representing the National Association of Retail Grocers 69
Discussion of above paper 72

Fourth Session (Afternoon of Wednesday, June 4, 1930)

Tour of the laboratories of the Bureau of Standards 73

Fifth Session (Morning of Thursday, June 5, 1930)

The inspection of weights and measures in pharmacies, by George F. Austin, jr., assistant supervisor, bureau of weights and measures, Detroit, Mich 74
Discussion of above paper 77
Report of committee on specifications and tolerances on specifications and tolerances for automatic-indicating scales, presented by F. S. Holbrook, chairman 79
Discussion of above report 80
The suppression of fraudulent practices, by J. M. Vanderslice, district supervisor, bureau of weights and measures, city and county of Philadelphia, Pa 86
Discussion of above paper 89
The annual report of the official:
Discussion of the scope and preparation of the report, by H. S. Jarrett, commissioner of weights and measures, State of West Virginia 92
Graphical presentation of data, by Henry D. Hubbard, Bureau of Standards 95
Demonstration of gasoline meters by manufacturers 104

Sixth Session (Afternoon of Thursday, June 5, 1930)

Demonstration of gasoline meters by manufacturers (continued) 105
Discussion of above number 105
Air releases on power-operated gasoline-dispensing units, by A. W. Schwartz, assistant superintendent, department of weights and measures, State of New Jersey 105
Testing vehicle-tank meters, by Massachusetts inspectors of standards .. 108
Discussion of above paper 111
Calibrating vehicle-tank compartments by liquid meters, by H. N. Davis, deputy commissioner of weights and measures, State of Vermont 112
Discussion of above paper 114

Digitized by Google

Page

Calibrating vehicle tanks by large-capacity measures, by S. T. Griffith, chief, division of weights and measures, city of Baltimore, Md. 115
Citation by weights and measures officials of important court decisions in their jurisdictions 120
Announcements 121

Seventh Session (Morning of Friday, June 6, 1930)

Report of committee on specifications and tolerances on modification of various codes, presented by F. S. Holbrook, chairman 122
The use and abuse of person-weighing scales, by Carl E. Dartt, president Columbia Scale Co 126
Discussion of above paper 128
Log rules, by A. W. Corwin, sealer of weights and measures, county of Allegany, N. Y 128
Motion in relation to special expenditure 133
Side-beam and hidden-weight scales, by J. C. Tinkey, deputy sealer of weights and measures, State of Ohio 134
Standardization activities of the National Scale Men's Association, by M. J. J. Harrison, chairman, committee on specifications, National Scale Men's Association 136
Report of committee on uniformity in weights and measures requirements 141
General consideration of subjects of interest and questions brought up for discussion by officials 141
Resignation of the treasurer, George F. Austin 142
Report of committee on nominations, presented by Francis Meredith, chairman, and election of officers 143
Report of committee on resolutions, presented by Albert B. Smith, chairman:
Address of the Assistant Secretary of Commerce, Hon. Julius Klein 143
Address of Hon. Randolph Perkins 143
Appreciation to the Director and staff of the Bureau of Standards 144
Retirement of George F. Austin 144
Chemically treated coal 144
Lubricating-oil bottles not complying with specifications 144
Molds and machine-filled cartons for ice cream 144
Appreciation to manufacturers demonstrating gasoline meters 145
Commendation to far-western States for representation at conference 145
George Washington Bicentennial 145
Appreciation to headquarters hotel management 146
Appreciation to the press 146
Discussion of report of committee on resolutions 146
Resolution in relation to standardization activities of the National Scale Men's Association 147
Report of the treasurer, George F. Austin 147
Wreath in memory of Louis A. Fischer 147
Motion in relation to expenditures 148
Suggestion as to program of twenty-fourth conference:
Desirability of specifications and tolerances for person-weighing scales 148

APPENDIX

Specifications and tolerances for automatic-indicating scales, adopted by the Twenty-third National Conference on Weights and Measures, June 5, 1930 150

Digitized by Google

Digitized by Google



Official photograph of delegates and guests attending the Twenty-third National Conference on Weights and Measures, assembled at the entrance of the East Building, National Bureau of Standards

Digitized by Google

REPORT OF THE TWENTY-THIRD NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

HELD AT THE BUREAU OF STANDARDS, WASHINGTON, D. C., JUNE 3–6, 1930

FIRST SESSION (MORNING OF TUESDAY, JUNE 3, 1930)

The conference was called to order at 10.55 o'clock a. m. by Dr. George K. Burgess, president of the conference.

OPENING ADDRESS BY THE PRESIDENT, DR. GEORGE K. BURGESS

Members of the conference and guests, it is again my duty and privilege to welcome you to this Twenty-third National Conference on Weights and Measures and to express my pleasure at seeing so many old friends among you. I wish also especially to greet those of you who are here for the first time, and to assure you that your active participation in the work of the conference will be most helpful.

It is with particularly keen regret that I note the absence of one of our most valued and helpful members, William F. Cluett, of Chicago, who on account of illness is missing for the first time in many years. I am sure you all join me in wishing him a speedy and complete recovery.

It has been customary in past years in my address to you to devote some attention to the subject of Federal legislation relating to weights and measures. The Congress has given somewhat less attention to matters directly related to weights and measures than has sometimes been the case.

The only new matters relating to weights and measures introduced since our last meeting are two resolutions pertaining to the metric system and a bill to provide for regulating traffic in certain clinical thermometers.

House Joint Resolution 124 provides that the Department of Commerce be authorized to establish commodity quantity units for general use in merchandising after 1935, standardizing the customary units to metric units; and House Resolution No. 125 would authorize and direct the Secretary of Commerce to conduct an investigation to determine the advantages and disadvantages of the general use in the United States of the metric system of weights and measures.

H. R. 9586, relating to clinical thermometers, prohibits the shipment in interstate or foreign commerce of any clinical thermometer which has not been tested or marked in accordance with the provisions of the bill. It further provides for the testing of thermometers under rules and regulations to be made by the Secretary of Com-

Digitized by Google

merce, such rules and regulations to include specifications and reasonable tolerances with which clinical thermometers shall conform.

The majority of the bills relating to weights and measures before Congress at the present time were introduced during the first session and reported upon at our last meeting. None of the bills has been enacted into law as yet. In relation to these I will confine my remarks to a few upon which further action has been taken by Congress, as follows:

H. R. 8, a bill to amend the national food and drugs act so as to prevent the slack filling of packages and deception by means of the form or shape of the container, passed the House on March 17, 1930.

S. 108, a bill to suppress unfair and fraudulent practices in the marketing and handling of perishable agricultural products by commission merchants in interstate and foreign commerce, passed the Senate June 3, 1929, and the House, with amendment, on May 14, 1930, and is now in conference. This bill has a good chance of passage.

H. R. 730, a bill to amend the national food and drugs act so as to require certain canned food to be of a standard quality, condition, and fill, in accordance with standards to be promulgated by the Secretary of Agriculture, passed the House on May 7, 1930. S. 1133, identical with H. R. 730, was reported out of the Senate Committee on Agriculture and Forestry with recommendation that it pass.

I have copies of most of these bills, which are at your service for examination at any time that you may so choose.

You will doubtless be interested in hearing something of our honorary president, Dr. S. W. Stratton, whom you remember was for so many years Director of the Bureau of Standards and president of this conference, and who has since been president of the Massachusetts Institute of Technology. Doctor Stratton has recently been made chairman of the executive committee of the corporation of the institute, being relieved of the duties of president, which have been assumed by Dr. Carl Compton, of Princeton University. Doctor Stratton in his new position maintains, as chairman of the board, the authoritative position from the point of view of the policy and finances of the institute. Doctor Compton is charged, more particularly, with the educational work of the institute. I see Doctor Stratton quite frequently, and I hardly ever meet him but he expresses his very great interest in the work of these conferences on weights and measures, and I am sure if it were possible he would be here and would enjoy welcoming you also.

Knowing your interest in the work of the Bureau of Standards, I shall describe in some detail certain phases of our work during the past year which have a direct bearing upon weights and measures.

You are already familiar with our work on railroad track scales and mine scales. That work has been continued through the year, and about the usual number of scales of these general classes have been tested, through the helpful cooperation of the railroads and weights and measures officials. I may say, in passing, that the funds for those two types of work have been consolidated into a single fund, which will make administration more easy and the carrying out of the work more satisfactory. I am also glad to report, in this connection, that through special appropriation Congress has provided the sum of

Digitized by Google

$40,000 for the replacement of our oldest track-scale testing equipment, No. 1, which through many years of service has become unfit for further use. We expect this car to be constructed within the next few months, and it will be put in operation as soon as possible.

The bureau has continued to cooperate with engineering societies, the American Standards Association, the American Petroleum Institute, the Federal Specifications Board, and other organizations engaged in the standardization of equipment and methods of test. The first-mentioned organization, by the way, has been reorganized within the last year. A board of directors has been set up in which the Director of the Bureau of Standards is the Government member, and the work is carried out by what is called the council of the association. As to the Federal Specifications Board, with which you are most familiar as the body which sets up and promulgates the buying and purchasing specifications for the departments, that board has been very active and is getting out specifications year after year which are used more and more by State, municipal, and other institutional buyers.

New equipment has been put into use in the optics division and in the weights and measures division of the bureau, which has materially increased the accuracy attainable in the graduation and calibration of precise standards of length. In the optics division line standards up to 4 inches in length have been graduated by means of light waves, and these have been tested on the new longitudinal comparator to an accuracy of two-millionths of an inch. A similar ruling machine, capable of ruling line standards up to 1 yard or 1 meter in length by means of light waves is nearing completion. Preliminary tests indicate a corresponding accuracy in this machine.

The new equipment in the weights and measures division includes a high-precision longitudinal comparator, a circular dividing engine, and a circle-testing machine. Although this equipment was purchased a few years ago, it is only within the past year that it has been sufficiently used to demonstrate fully its precision, accuracy, and convenience of use.

The comparator has found extensive use in the calibration of line standards ruled in the optics division, already referred to, and in the intercomparison of various high-precision line standards belonging to the bureau, and several belonging to the Canadian Government and to various universities. The consistency and precision of the results obtained are such as to indicate that our precise standards of length are on a much higher plane as to accuracy than ever before.

Good progress has also been made in the graduation and calibration of precision circles such as are used on transits and theodolites for the accurate measurement of angles. Experience so far gained indicates that 9-inch theodolite circles graduated by the bureau are not in error by more than 2 seconds of arc, and 6½-inch circles are not in error by more than 3 seconds of arc. Calibrations of these circles by three different observers are consistent to within 1 second.

A new device developed in the volumetric section permits the testing of dilution pipettes in a much shorter time than was possible by the methods formerly in use, and at no sacrifice of accuracy. The new method makes use of a micrometer head and a cylindrical plunger of known dimensions to determine by direct measurement

Digitized by Google

the ratio of volumes. This device has greatly speeded up our work in testing dilution pipettes which are used so extensively in medical diagnosis.

The testing equipment that I have mentioned will be on exhibition in the bureau, and I hope you will feel free either Wednesday afternoon at the time set aside for that purpose, or whenever it is convenient to you, to see any of those pieces of equipment in which you may be interested.

Returning for a moment to length standards, you may remember that at the last conference I gave a summary of the international work in regard to these standards and particularly to the work of the international committee on weights and measures of the International Bureau. There was one thing that it was hoped would be passed but which had not as yet been passed, namely, the designating of the temperature at which shop standards of length—gages and other appliances used in the shop—should have their correct nominal length. The temperature upon which practically everyone was agreed for that purpose, was 20° C. or 68° F. I may now say that all the countries concerned are in agreement, with the exception of Great Britain who has not yet disagreed. My latest information from Great Britain is that the industries of Great Britain, which are on a 62° F. basis, have not yet come to accept the 68° F. However, there are prospects that Great Britain will come in, and if she does that will make a uniform practice for shop standards.

One problem in the field of precise length measurement is receiving attention in practically all of the national research laboratories; that is, the precise measurement of length in terms of light waves. New applications of the results of research in this field seem certain to lead to still further increase in the precision and accuracy of industrial and engineering measurements of length.

A notable example is the development by two Japanese scientists of a modification of the Fabry-Perot interferometer apparatus by means of which the length of a 24-meter geodetic tape is measured directly in terms of light waves, with the same facility that short end standards are ordinarily compared. They have shown that the method is applicable to lengths up to several hundred meters.

A report of particular interest to weights and measures officials in this country and in Great Britain has recently been issued by the Board of Trade, London. This is a report of the intercomparisons carried out in 1922 to 1927 between the Imperial Standards of Great Britain and the several Parliamentary copies of these standards.

The intercomparisons reported upon are the most extensive and thorough that have been made since the adoption of the present standards. The report also includes a comparison of the metric standards of Great Britain with those of the International Bureau of Weights and Measures, and a new determination of the relation between the imperial yard and the international meter. The report is 68 pages in length; and I can, therefore, give only a brief reference to it. The general conclusion as summarized by Mr. Sears, deputy warden of the standards, is as follows:

General conclusions.—Although the results of the 1922–23 comparisons have established the values of both the yard and the pound on a firmer basis than for some decades past, it has become very apparent that neither series of

Digitized by Google

standards is of a quality corresponding to that of more modern primary standards, or to the possibilities and requirements of present day scientific and industrial development. The defects remarked in the two immured standards are, to a less degree, present in all the series, and it would appear desirable that early consideration should be given to the problem of determining the best procedure to be adopted for their ultimate replacement by standards of greater accuracy and refinement.

As far as the standard of length is concerned, the International Committee for Weights and Measures have already expressed the hope that it may eventually be possible to supersede the material prototype metre by a definition in terms of the wave length of light. Investigations are already in progress in the various national laboratories with a view to formulating the proper conditions for such a definition. It would probably be best to defer any attempt to replace the existing imperial standard yard until these investigations are completed.

With regard to the standard of mass, no better material appears to be available than the platinum iridium alloy of which the kilogramme standards are made. If the indications of the present report are confirmed by the results of the next decennial comparisons, which fall due to be made in 1932, it will probably be found best to proceed forthwith to reconstruct the pound standards in this alloy, prepared by the best modern processes.

I would now like to refer to some of the items on our program for this conference:

You remember last year we had the pleasure of listening to Secretary Lamont, who addressed you. This year we will hear from Doctor Klein, who is the Assistant Secretary of Commerce, and was previously for several years the Director of the Bureau of Foreign and Domestic Commerce. Having occupied those positions, Doctor Klein is closer, perhaps, to our industrial picture both at home and abroad, than any man in the United States. I am sure you will find his address of very great interest.

This year we will also be favored by an address by the Hon. Randolph Perkins, chairman of the Committee on Coinage, Weights, and Measures of the House of Representatives. The committee of which he is chairman has the duty of considering all bills which concern this conference, as they come up in Congress.

On our program we have a considerable number of other items of very great interest. Perhaps the one subject which is going to be of the greatest prominence and interest is that dealing with oil, gasoline, and greases. On Thursday we have a symposium of papers relating to those subjects, and this afternoon we shall have a paper by Paul Hadlick, representing the American Petroleum Institute, and the report of the committee on specifications and tolerances on specifications for grease-measuring devices. Your committee on specifications and tolerances has been going over the field very carefully and has had sitting in with it from time to time representatives of the industries concerned.

We also have a paper on that very important commodity, cotton, the question being one of merchandising. The paper is entitled "The Sale of Cotton by Net Weight, and the Standardization of the Bale," which is of very great importance in our commerce. This paper will be given by Arthur W. Palmer, chief of the division of cotton marketing, Bureau of Agricultural Economics, United States Department of Agriculture.

There are a number of other speakers whom I will not take the time to mention, but I am sure they will be heard with very great interest by the members of the conference.

Digitized by Google

Turning to publications of the bureau recently issued which may be of especial interest to members of the conference, we have, of course, first, the Report of the Twenty-Second National Conference on Weights and Measures, Miscellaneous Publications, Bureau of Standards, No. 101, which has been issued for some time, and of which, I hope, all of you have already received copies.

Then we have Miscellaneous Publications No. 104, Testing Equipment for Large-Capacity Scales for the Use of Weights and Measures Officials, which we think will be useful to you in your work and in improving the facilities of your departments.

I want particularly to refer to this modest document which is called Weights and Measures References, Miscellaneous Publications No. 103. I think all of you—at least all of you who are in regular attendance—have received copies of this publication. It includes, among other things, an index of all the proceedings of these conferences on weights and measures, and I think one can not but be impressed in looking over the subject matter of this index by the very great breadth and depth and scope of the work of these conferences on weights and measures.

In this connection, I am convinced that these annual meetings of the weights and measures officials are of the very greatest importance. You discuss model laws and specifications and tolerances; you hear papers on many subjects—some are on new developments, some show the way toward the future and point out what should be done, some are controversial, some historical—all this is very useful and helpful. I feel that these conferences, starting in 1905 and continuing to date, are to be highly congratulated on the work that has been done. But that is not all; the work you have done has borne fruit elsewhere. We had, for example, in the city last week a conference of delegates from the various States interested in traffic problems. That was a voluntary conference, the same as this, made up of delegates in part appointed by the governors of the various States, in part representatives of cities, and individuals. They have a very great problem, and their method of attacking it is somewhat similar to yours. Also we have at the bureau this week the conference of the utility engineers. Their method of procedure is also quite similar. So in a way this conference has not only been responsible for what it has done itself, but it has been a good example to other lines of activity requiring voluntary cooperation on the part of representatives from the various States.

Turning again to publications, the Standards Yearbook is being issued as heretofore, annually, and the 1930 book is out. I am sorry to say it is not available for free distribution. We also have the annual report of the bureau, which is available for any of you who wish it. The work of the railroad track scale testing service of the Bureau of Standards during the fiscal year July 1, 1928, to June 30, 1929, is summarized in Letter Circular No. 276. There have been issued several publications relating to gages and screw threads. Then there is a chart for use in determining angles. Screw-thread tables are being gotten out in more convenient form for public use. We have a publication also on domestic and industrial fuel oils; also weights per United States gallon and cubic foot for sugar solutions. We have been doing some work on the question of light standards,

Digitized by Google

and we have a report on the first spectrum of krypton. These are available for your information, and copies, except of the yearbook, can be had. Lastly, I mention the publication, Commercial Standards Monthly, which is evidently meeting a long-felt want; the subscription list of this is now, I believe, approaching 4,000.

Your chairman had the opportunity to go to Japan last fall as the delegate of the United States Government to the World Engineering Conference. I am sorry to say that I did not have the opportunity of seeing in detail, as I had wished, the weights and measures administration of Japan. I did, however, get in contact and noted certain things of interest, and I did visit a great many laboratories. That visit was most extraordinarly interesting. The Japanese people are most remarkable, most vigorous from the point of view of development. I was greatly astounded at the enormous development they have made on standardization, on the one hand, and on research on the other; particularly in research. I did have an opportunity of seeing how they carry out their work in the inspection of electrical apparatus which is not strictly weights and measures in the purview of this conference, but nevertheless closely allied to it. The railroads of Japan belong to the Government. Means of communication also belong to the Government—that is, the radio, telegraph, and telephone. The power activities of Japan, however, do not belong to the Government, but are under Government regulation. Nevertheless all the electrical equipment that is bought by the Japanese Government is tested by the Government. I was greatly impressed. For example, they have a laboratory on the outskirts of Tokyo and another one at Osaka. In the laboratory at Tokyo they had testing equipment of all kinds and over 1,000 men were employed in that kind of work. That gives you an idea of the thoroughness with which they go into anything which they agree upon to do. When it is agreed that the electrical equipment that the Japanese Government buys will be tested, it is tested. I have a feeling that if we were charged with the testing of all the equipment that the Government buys we would be terribly swamped. Japan has a population of about 59,000,000 in the island, while we have some 120,000,000. On the same basis we would require 2,000 or more persons to do the testing in this country. I am happy to say that we do not have to do the work. The weights and measures work of Japan is centralized and the standards work is carried out in cooperation with industry; but the Government has the last say, and that places it in a very powerful position. Any program they wish to carry out can be accomplished.

It is interesting to know that there have been three systems of weights and measures in use in Japan—the Japanese system, the English system, and the metric system. Originally they had only the Japanese system; then the English and the metric systems were added about the same time—I think in 1919. Then in the Government they tried an experiment. The war department adopted one system and the navy department the other. I think it was the navy which operated under the English system and the war department which operated under the metric system. They tried in this way to make a comparison, and they have been going on on that basis.

A professor of mechanical engineering of Tokyo explained the complexity of the present conditions. He stated that in the case of

Digitized by Google

an ordinary I bar, which is used in building construction, it was common practice, for example, to put the length of the I bar, let us say, in the English system, the height and width of the I bar in the Japanese system, and the thickness of the metal employed in the metric system; as a result the Japanese engineer had to work on the same piece of metal in three systems. The situation now is that in 1924 the Japanese Imperial Diet passed a law making the metric system compulsory and the sole system, to become effective in 1934.

That is in brief what I have to report in relation to weights and measures that I saw in Japan. I might also state that they are very skillful in making up packages to sell. I believe they are the best packers there are. You can buy a dried dinner—dinner No. 4 or dinner No. 6 or dinner No. 20—in which everything to make up the dinner, including the materials for soup and dessert, are in one package—which is carrying simplicity right into the home.

The Engineering Congress was very well attended, indeed, by several hundred foreign engineers and several hundred Japanese; there were 800 papers, this bureau presenting a paper on precision measurements and instruments for measurements of length. That congress was a very great success, indeed, and of course the Japanese were very proud in having entertained the first engineering congress held in the East.

Now, gentlemen, I have perhaps taken more than my allotted share in the discussion of the work of this conference, the work going on, and in referring to my visit to Japan. I want to say that I believe these conferences are of the very greatest use to the members concerned, and I want to say to the new members that you have an opportunity to get acquainted with the old members and what is going on at the bureau. Some of the best results are from our informal contacts; and, in addition to the printed program, if any of you have matters which you want to bring up, arrangements may be made to have them discussed in the conference.

We will now proceed to the regular order of business.

ABSTRACTS OF STATE REPORTS [1]

ALABAMA

By R. C. Sharp, *Chief Inspector of Weights and Measures, Birmingham*

Mr. Sharp reported that H. S. Holloway had recently succeeded H. L. Flurry as chief of the State division of weights and measures, but that Mr. Holloway had been unable to make arrangements to be present at the conference.

CALIFORNIA [2]

By J. S. Casey, *Chief, State Division of Weights and Measures*

Mr. Casey reported that his division was in a flourishing condition, with adequate funds, added equipment, and a well-trained personnel. Charged with the enforcement of numerous statutes in addition to the weights and measures law, the division has enough inspectors, so that each may specialize in a particular branch of

[1] For convenience of reference these reports have been arranged in alphabetical order throughout.

[2] This report was submitted through C. M. Fuller and was read to the conference by him.

Digitized by Google

the work. Mr. Casey noted the good results which have followed the State weights and measures conference held in October, 1929.

CONNECTICUT

By PHILIP T. PILON, *State Inspector of Weights and Measures*

Mr. Pilon stated that there had been an increase of over 14 per cent in the number of inspections as compared with the record of the previous year. The attitude of the business interests of the State toward weights and measures regulation was said to be particularly friendly, with satisfactory conditions prevailing in all sections. A program to strengthen the weights and measures statutes is planned for the next legislature, which will convene in January.

DELAWARE

(An official was in attendance from Delaware, but no report from this State was presented to the conference.)

DISTRICT OF COLUMBIA

(Officials were in attendance from the District of Columbia, but no report from the District was presented to the conference.)

GEORGIA

By S. H. WILSON, *State Oil Chemist*

Mr. Wilson reported that the general weights and measures bill which had been prepared for introduction at the last legislative session was not introduced because of local conditions which made such action inadvisable; this bill, which follows the model State law of the conference, will, however, be offered at the first favorable opportunity. Six inspectors now devote all of their time to the inspection of gasoline-dispensing devices under a law requiring that such devices be tested once every three months.

IDAHO

By ERNEST J. CROUCH, *Director, State Bureau of Weights and Measures*

Mr. Crouch outlined the history of the Idaho weights and measures statutes, stating that it has only been since 1923 that active inspection has been carried on. He said that the laws are considered inadequate for proper supervision, and that his division is handicapped by insufficient funds. Several efforts have been made to secure the enactment of a comprehensive law based upon the model law of the conference, but so far these efforts have been unsuccessful. In so far as possible, the recommendations of the conference as to specifications and tolerances are being followed out in the work of the division.

ILLINOIS

By W. T. FOSSETT, *State Superintendent of Standards*

Mr. Fossett reported that there are now 12 State inspectors of standards carrying on field work throughout the State; these men are supplied with new automobile trucks for the transportation of

Digitized by Google

their equipment. Seventeen cities are now required by statute to have local inspectors, and this number will be increased as a result of the last census. Mr. Fossett commented upon the success of the State weights and measure conference held in March. There has been no new legislation enacted recently.

The CHAIRMAN. We have a communication from William F. Cluett, chief deputy inspector of weights and measures of the city of Chicago, who is one of the oldest members of the conference and who is unfortunately unable to be present at this conference for the first time in many years. This communication reads as follows:

To Doctor Burgess, president, F. S. Holbrook, secretary, officers, members, and guests of the Twenty-third National Conference on Weights and Measures: Greetings. May you have the best, liveliest, and most educational weights and measures conference in your history, is the wish of William F. Cluett, resting on the side lines because of illness.

(Signed) WILLIAM F. CLUETT.

INDIANA

By I. L. MILLER, *State Commissioner of Weights and Measures*

Mr. Miller described briefly the new outfit for the testing of large-capacity scales, just acquired by his department; this equipment will carry 6,000 pounds of standard weights, and will have a gross weight of about 7½ tons. The 500-pound weights comprising the bulk of the test-weight load will be handled on the scale platform by means of a 2-wheeled cart. Mr. Miller also commented upon a case recently begun against his department in connection with the standard-weight bread law.

KENTUCKY

(An official was in attendance from Kentucky, but no report from this State was presented to the conference.)

MAINE

(Officials were in attendance from Maine, but no report from this State was presented to the conference.)

MARYLAND

By S. T. GRIFFITH, *Chief, Division of Weights and Measures, Baltimore*

Mr. Griffith stated that the efforts to secure the passage of a comprehensive weights and measures law for the entire State, which met with defeat a year ago, would be continued, and that with the assistance of the State board of agriculture and department of markets it was believed that success would eventually be achieved. He commented briefly on the administration of weights and measures in the city of Baltimore, stating that the conference recommendations as to specifications and tolerances are largely followed.

Digitized by Google

MASSACHUSETTS

By FRANCIS MEREDITH, *Director, State Division of Standards*

Mr. Meredith reported that during the year a considerable amount of time has been devoted to examinations for type approval—gasoline pumps, meters, metering systems, and grease-measuring devices having predominated in this work. Some 6,000 licenses were also issued under the several licensing laws administered by the division. An appropriation of $7,000 was made by the last legislature for the procurement and equipping of a special truck to be used for the testing of large-capacity scales.

MICHIGAN

By PETER D. DUKESHERER, *Director State Bureau of Foods and Standards*

Mr. Dukesherer reviewed the history of weights and measures legislation in Michigan and compared the condition of commercial equipment during the first years of active enforcement with its present condition, as revealed by the records of inspection results, noting the tremendous improvement which has taken place. Through a cooperative arrangement with the State board of pharmacy, inspectors of that office test the weighing and measuring equipment in all drug stores. It was stated that the State highway department plans to install ten 60-ton scales for checking loaded trucks on the highways.

NEW HAMPSHIRE

(An official was in attendance from New Hampshire, but no report from this State was presented to the conference.)

NEW JERSEY

By J. HARRY FOLEY, *State Superintendent of Weights and Measures*

Mr. Foley gave a general résumé of the activities of his department. He said that examinations for type approval had consumed more time than heretofore, devices used for the dispensing of petroleum products predominating among those submitted. A program of educational work among the people of the State has been vigorously carried out. During the year over 800,000 yards of thread have been remeasured under the thread law enacted several years ago. Numerous special investigations have been conducted, among which Mr. Foley mentioned particularly those on butter, potatoes, and grapes.

NEW YORK

By C. P. NORGORD, *Assistant Commissioner, State Department of Agriculture and Markets*

Mr. Norgord outlined two important policies of the State bureau, as follows: First, since the bulk of the inspectional work in the State is performed by city and county officials, and the State force is very small, effort has been concentrated on raising the efficiency

Digitized by Google

of local departments. Second, as to inspectional work performed by the State inspectors, emphasis is placed for considerable periods upon one or two lines, with a parallel program of publicity; during the past year the emphasis has been on coal and gasoline. Mr. Norgord stated that excellent results had followed the plan of holding hearings at the department in the case of violations of the statutes.

NORTH CAROLINA

By WILLIAM H. RICHARDSON, *Editor, State Department of Agriculture*

Mr. Richardson reported that the license tax act of 1929, designed to provide revenue to carry on weights and measures supervision in the State in lieu of the inspection fees provided for by the earlier law, had not produced enough revenue to permit the work to be carried on as extensively as anticipated. He stated, however, that with the cooperation of some of the cities which have employed inspectors and the assistance which the State department had been able to render much good work had been accomplished.

OHIO

By J. C. TINKEY, *Deputy State Sealer of Weights and Measures*

Mr. Tinkey advised that supervision of weights and measures work in Ohio is now under the division of feeds and fertilizers of the department of agriculture, D. M. Odaffer being chief of that division. He commented upon a successful State conference held last December, and upon the continuance of district conferences throughout the State. The inspectional work of the local and State departments was briefly summarized, and it was stated that the triennial inspection of local standards was nearing completion; the importance of this latter work was demonstrated by the fact that of the apparatus examined 39 per cent required adjustment and over 6 per cent was found unfit for use.

PENNSYLVANIA

By ALBERT B. SMITH, *Director State Bureau of Standard Weights and Measures*

Mr. Smith reported that during the year special attention had been paid to the testing of gasoline dispensing equipment and oil bottles, with the result that marked improvement in conditions had been brought about. Special efforts had also been directed toward milk bottles, with particular reference to the capacity point and the elimination, under a new law, of bottles of capacities of 5, 10, and 12 fluid ounces. Mr. Smith mentioned the steps which had been taken by the State bureau in certain jurisdictions where the local officials had become lax in the discharge of their duties.

RHODE ISLAND

By LOUIS B. JONES, *Superintendent of Weights and Measures, Providence*

Mr. Jones reported only for his city, in which the weights and measures personnel consists of the superintendent and four deputies. He briefly summarized the inspectional work of the department, noting that the mechanical condition of the commercial equipment in use was practically the same as in the previous year.

Digitized by Google

TENNESSEE

By T. F. MAHONEY, *Sealer of Weights and Measures, Chattanooga*

Mr. Mahoney reported that his State had recently undertaken the testing of gasoline for quality, this work being carried on in all parts of the State by means of a traveling laboratory mounted on a truck. While the chemist is making his analyses for quality in a given city or town, an inspector of weights and measures, who also accompanies the truck, tests all of the gasoline-measuring devices in use.

TEXAS

By V. A. STOVALL, *Chief Inspector, State Division of Weights and Measures*

Mr. Stovall discussed the efforts of his division to secure additional legislation during the past year, which were successful in only one instance, an amendment to the general penalty section whereby this was materially strengthened. Bills to amend the public weighers law, to provide for the licensing of operators of gasoline dispensing devices, and to provide additional revenue for the department through the levying of an assessment of 2 cents on each bale of cotton at the compresses, all failed of passage.

UTAH

By B. D. NEBEKER, *Superintendent of Weights and Measures and Oil Inspection, Salt Lake City*

Mr. Nebeker spoke briefly on the organization of weights and measures supervision in Utah, and stated that progress was being effected notwithstanding numerous handicaps. In so far as practicable, the conference recommendations as to specifications and tolerances are being followed by the State and local offices. Mr. Nebeker also commented upon the problem of gasoline shrinkage as affected by the temperatures prevailing at the time of measurement.

ANNOUNCEMENT AND MOTION

The CHAIRMAN. The time for recess is approaching, and before we do recess the secretary, Mr. Holbrook, has an announcement to make.

Mr. HOLBROOK. I wish to state that two reports of the committee on specifications and tolerances are now in mimeographed form and may be obtained for consultation before these matters come before the conference for action. One of these is the report on grease-measuring devices, which will be considered this afternoon, and the other is the report on odometers, which will be considered to-morrow morning. Copies of these reports are now on the desk.

Mr. RAGLAND. Mr. Chairman, I move that the secretary be instructed to send to Mr. Cluett, of Chicago, some flowers and a suitable telegram, expressing the sympathy of this conference in his illness.

(The motion was seconded, the question was taken, and the motion was agreed to.)

(At this point, at 1 o'clock p. m., the conference took a recess until 2 o'clock p. m.)

Digitized by Google

SECOND SESSION (AFTERNOON OF TUESDAY, JUNE 3, 1930)

The conference reassembled at 2.05 o'clock p. m., Dr. George K. Burgess, president, in the chair.

ABSTRACTS OF STATE REPORTS—Continued

VERMONT

By H. N. DAVIS, *Deputy State Commissioner of Weights and Measures*

Mr. Davis reported the promulgation of a regulation requiring antidrain nozzles on meter pumps and of specifications and tolerances for these devices. He said that his department had been spending considerable time in checking maple-sugar sirup, stating in this connection that Vermont produces 80 per cent of all the maple products made in New England. In general, he reported progress and satisfactory conditions throughout the State.

VIRGINIA

By J. H. MEEK, *Director State Division of Markets*

Mr. Meek stated that the principal weights and measures activities of his division were along the line of cooperation with the local sealers of the State. A program of testing large-capacity scales, begun two years ago, has produced gratifying results in the repair and replacement of incorrect equipment; in the trucking sections of the State a considerable number of produce barrels have been measured; recently an extensive program of testing gasoline-measuring devices has been inaugurated. The State division has also done considerable work in counties where there are no local sealers.

WEST VIRGINIA [3]

By HOWARD S. JARRETT, *State Commissioner of Weights and Measures*

Mr. Jarrett said that because of inactivity in the coal business the testing of mine scales had occupied less time than usual, and his inspectors had been able to devote more time to other phases of weights and measures work; he particularly mentioned their activity in the examination of equipment in retail stores, the checking of package goods, and the investigation of numerous complaints. Mr. Jarrett also presented an interesting analysis of the gasoline equipment situation, pointing out that the amount of equipment in use is increasing faster than the sales of gasoline.

[3] This report was read to the conference by P. T. Sullivan.

Digitized by Google

WISCONSIN

By GEORGE WARNER, *Chief State Inspector of Weights and Measures*

Mr. Warner confined his report to a discussion of four weights and measures bills introduced into the last legislature, two of which became law. Under a consolidation statute, the State weights and measures organization is now a part of the newly created department of agriculture and markets, although for practical purposes the work of the organization is not affected. The statute relating to Babcock glassware was strengthened, making it easier to secure convictions for violations. A bill to establish a standard for a cord of wood and a bill to make the weights and measures inspectors regular members of a State constabulary failed of passage.

ABSTRACTS OF REPORTS OF REPRESENTATIVES OF STATE ASSOCIATIONS OF WEIGHTS AND MEASURES OFFICIALS

INDIANA ASSOCIATION OF INSPECTORS OF WEIGHTS AND MEASURES

By I. L. MILLER, *State Commissioner of Weights and Measures*

Mr. Miller reported that with very few exceptions the Indiana association had met regularly each year since 1911. Owing to a conflict of dates with another State association the 1930 meeting of the Indiana organization has been postponed from June to September.

MASSACHUSETTS ASSOCIATION OF SEALERS OF WEIGHTS AND MEASURES

By HOMER J. MELIDY, *Deputy Sealer of Weights and Measures, Worcester*

Mr. Melidy noted an increase in the membership of the association as compared with the records of a year ago. He stated that the meetings of the association are attended not only by weights and measures officials but also by the public. One of the principal activities of the Massachusetts association is in connection with the passage of suitable weights and measures legislation.

MICHIGAN STATE, COUNTY, AND CITY SEALERS' ASSOCIATION

By GEORGE W. MAHN, *Sealer of Weights and Measures, City and County of Saginaw*

Mr. Mahn extended a general invitation to attend the seventeenth annual meeting of the association to be held in Benton Harbor in June, and gave a résumé of the program which had been arranged for the meeting.

NEW JERSEY WEIGHTS AND MEASURES ASSOCIATION

By JOSEPH G. ROGERS, *Assistant State Superintendent of Weights and Measures*

Mr. Rogers announced that the next meeting of the association would be held in September at Asbury Park, and issued a general invitation to attend the sessions. He gave a detailed report of the matters considered at the midwinter meeting of the association, held in Trenton in February, and recommended that other associations adopt this idea of a short executive session to be held between the regular annual meetings of their organization.

Digitized by Google

NEW YORK STATE ASSOCIATION OF SEALERS OF WEIGHTS AND MEASURES

By J. H. STEPHENSON, *Sealer of Weights and Measures, Rochester*

Mr. Stephenson extended a general invitation to attend the sessions of the twenty-third meeting of the association, to be held in Niagara Falls in July.

OHIO SEALERS' ASSOCIATION

By J. C. TINKEY, *Deputy State Sealer of Weights and Measures*

Mr. Tinkey said that the association was interested in securing a revision of the State weights and measures statutes, and has a committee working toward that end. Last year the association indorsed the standardization of package goods in units of multiples and submultiples of the pound and gallon. The next meeting of the association will be held in December.

The CHAIRMAN. It occurs to the chair that these reports from State associations show the advantages of forming such organizations in the several States for the purpose of fostering the work of weights and measures supervision and stimulating the interest of those engaged in this work. I think that all of the States which have such associations should encourage the formation of similar associations in the other States.

NOTES ON GREASE-MEASURING DEVICES

By RALPH W. SMITH, *Bureau of Standards*

I think it is a fact that up to the present, the number of weights and measures officials who have made a study of grease-measuring devices is relatively small. It therefore appears appropriate at this time to consider briefly the various types of these devices which are at present on the market. I hope that this résumé of the principles of operation of the various types which have been developed up to the present time will be of interest and assistance to the conference.

What I shall say is based upon the latest information which we have been able to secure upon this subject. We have endeavored to learn the names of all manufacturers of grease-measuring devices and the character of the product which they make. In this we believe that we have been fairly successful. We have learned that some companies previously making these devices have discontinued their manufacture, that some companies are modifying their design in view of the conference code of specifications and tolerances, and that some manufacturers have just entered or are about to enter this field.

At the outset I believe it is well to mention again, and to emphasize, that the conference code for grease-measuring devices concerns itself only with those instruments intended to dispense greases and oils for automobile transmissions and differentials, and to register the amount of grease or oil dispensed. The large group of devices known variously as "pressure lubricators," "chassis lubricators," "grease guns," etc., used for the lubrication under relatively high pressure of bearings and other moving parts, is excluded from

Digitized by Google

the conference code and is of no direct official interest to the weights and measures officer because the amount of grease or oil dispensed does not enter into the charge assessed for such a greasing operation. The cost of the lubricant is relatively unimportant compared with the cost of the servicing operation, and no direct charge is made for the lubricant itself. You will realize that the reverse is true in the case of what we call a "grease-measuring" device, where the cost of the service is secondary, the cost of the lubricant is the important item, and the charge for the greasing operation is fixed by the amount of lubricant dispensed. In what follows, therefore, I will confine myself to what we have defined in the conference code as a grease-measuring device. Let me also make it plain that no effort has been made to determine how many of the units discussed are in compliance with the requirements of the conference code.

The results of our survey indicate that there are now made three principal types of grease-measuring devices—the meter type, the gear type, and the piston type. There is one common characteristic of all of these types and that is that the quantity is determined by a measuring operation of some sort. You will remember that the conference code specifically exempts grease-weighing devices which may be used for the same purpose as the grease-measuring device. We know of no unit being made which utilizes a weighing operation to determine the amount of grease dispensed, but such a unit may be developed and, if so, a number of the provisions of our present code would be inapplicable to such a device; it was therefore considered appropriate to exclude from the provisions of the code a grease-dispensing unit based upon the gravimetric principle, leaving the consideration of this type to such time as it may make its appearance in the commercial field. It may not be out of place to repeat that the primary reason for requiring that grease-measuring devices be designed to indicate and deliver in terms of pints rather than in terms of pounds was that these devices universally measure rather than weigh and that if pound indications had been permitted this would have introduced a series of weights and measures enforcement difficulties in addition to being fundamentally inconsistent and unsound.

Reverting now for brief consideration to the three types of grease-measuring devices which I have mentioned—meter, gear, and piston—I would say, first, that my conception of a meter type is one in which the lubricant passes through an automatic measuring element called a meter and by its passage causes registration of the amount dispensed; in other words, by "meter" I mean "flow meter" in its commonly accepted sense. Some manufacturers appear to use the term "meter" in referring to a mere counting element, such as a tallying device which is distinctly separate from the measuring element and which records the movement or the number of operation cycles of a piston-and-cylinder combination; I do not consider such usage accurate or desirable. We find that there are 10 manufacturers who market devices embodying "meters" according to my definition; all of these utilize air pressure to force the lubricant through the measuring element, and one manufacturer also has a unit in which an electrically-driven pump performs this function. On 6 of these units the meters indicate up to 8 pints, 1 indicates up to 10 pints, and 3 indicate up

Digitized by Google

to 12 pints; 6 of the units are or may be equipped with totalizing counters; 1 of these units has an automatic valve to release the air pressure when the supply of lubricant is exhausted.

We find only one unit constructed on the "gear" principle. Here the lubricant is expelled by being drawn between and forced through meshing gears, which are revolved by means of a hand crank. A counter reading to 5½ pints is connected with the measuring gears. This unit is provided with an automatic locking mechanism to make it inoperative when the supply of lubricant is exhausted.

In the piston-and-cylinder type we find one in which the entire "bottle," or container for the lubricant, is the cylinder, with a large piston driven by air pressure and connected to an indicating mechanism by means of a spiral metal "ribbon." The tallying device, or "job indicator," on this unit will indicate up to 10 pints, and there is also a "supply indicator" to show the amount of lubricant remaining in the unit at all times; as a result of its general design this unit necessarily becomes inoperative when the supply of lubricant is exhausted.

There appear to be five manufacturers making units in which a relatively small-capacity cylinder is connected with a container holding the lubricant, the pistons being operated by hand cranks and having tallying devices to count the piston strokes; the maximum registration on the counters is 5 or 8 pints. On one of these units there is an indicator designed to show before each discharge stroke that the piston is properly filled; warning of exhaustion of the supply of lubricant is given through failure of the indication just mentioned.

There remains to be mentioned only that class of piston-type dispensers in which no effort is made to register the number of piston strokes comprising delivery to an individual customer; the original types of so-called "grease buckets," "grease paks," "bucket pumps," etc., are in this class. Many of these are in use throughout the country, and it is probable that there are numerous manufacturers of this simple type whose names have not come to our attention. Some manufacturers of whom we happen to know seem inclined not to modify their devices to conform to the requirements of the conference code, while others are endeavoring to do so.

In any consideration of grease-measuring devices the question naturally arises as to how these devices may best be tested for accuracy by the weights and measures official. I do not propose to go into an exhaustive discussion of testing methods for these instruments nor to offer any definite test routine. Some general comments, however, may be of assistance to you when you decide to undertake seriously the regular examination of grease-measuring devices.

I realize, as, I am sure, do all of you who have attempted to test one of these devices, that the testing operation is attended with certain difficulties and annoyances not met with in the examination of many of the weighing or measuring devices which you are called upon to test. The units must be tested when filled with the lubricant which they are intended to dispense, and this lubricant itself must be the testing medium. The nature of greases and oils makes them somewhat inconvenient and unpleasant to handle, the operation is not a particularly clean one, and the whole test may be somewhat inelegantly but nevertheless truthfully characterized as

Digitized by Google

"messy." The problem, then, is to make the best of an unpleasant situation, without sacrificing any essential elements of the test or jeopardizing the accuracy of the results.

Since the unit indicates in terms of pints, its discharge must be measured volumetrically or a conversion must be made into volumetric units. It is obvious that the inspector can not afford to use his regular standard volumetric measures direct in the test of a grease-measuring device, because these standards must be kept clean at all times to avoid contaminating any capacity measures which may be compared with them. One method which may be followed for volumetric testing is to determine the accuracy of one or more ordinary commercial capacity measures by the use of the inspector's standards and then make the discharge from the grease-measuring device into the commercial measures; in such a case it will be necessary that the commercial measures be wiped out or otherwise cleaned between each observation so as to remove from the walls of the measures all of the adhering grease or oil. It is probable that in some places no difficulty will be experienced in borrowing from the station or garage operator the necessary number of commercial capacity measures to use as suggested. In other cases, however, it may be that there will only be available at the station or garage lubricating-oil measures of a type which would not be suitable for this use in that they are equipped with special spouts to facilitate crankcase filling. Here it would seem that the weights and measures official would be obliged to make his own provisions for carrying on the test of the grease-measuring device. To meet this situation some officials have proposed the use of paper containers such as the rigid or semirigid cups, buckets, and cartons manufactured for the dispensing of food products. Such containers when of lightweight material may be used but once, or at most only a few times, and are then to be discarded; to avoid distortion of such containers it would be necessary that a supporting form be used, similar to those used with ice-cream buckets. In the case of the heavier varieties of paper containers, however, they may repeatedly be cleaned between observations and used a considerable number of times before being thrown away. It would be necessary, of course, that each such container used, whether of light or heavy material, be carefully tested by means of the inspector's standard measures because, when used as indicated, the paper container becomes the standard by which the grease-measuring device is directly tested, and its accuracy must have been established before such use.

As I see the matter, the greatest objection to the use of paper containers or commercial measures for the testing of grease-measuring devices is the determination of the error of delivery so that the tolerances may be applied. All of these units are relatively "insensitive," due to their broad tops. On account of the nature of the material involved in the test, it is obvious that the inspector can not utilize a small diameter graduate in applying the tolerance as is done in the case of measures being tested with water or other testing mediums of low viscosity. It is probable that it will be necessary for the inspector to determine by means of tests made with water, and to mark upon the inside of the measures or containers used to receive the discharge from the grease-measuring device, the height corresponding to the nominal capacity of the measure or container,

Digitized by Google

and then to establish above or below this point lines corresponding to the maximum and minimum amounts allowable under the tolerances. He will then require that the grease-measuring device be so adjusted as to make deliveries within these limits. This procedure is not a very satisfactory one, however, and a very high degree of accuracy is not to be anticipated from its use.

There is another method of testing the discharge from a grease-measuring device which is susceptible of higher precision of results and which avoids some of the difficulties noted above, but which introduces one new factor as an essential element of the operation. I refer to the gravimetric or weighing method of testing the discharge, under which it first becomes necessary to determine the weight per pint of the testing medium; that is, of the oil or grease with which the unit under test is filled. In using this method the inspector must, of course, be provided with a suitable scale. The inspector's regular 10-pound testing balance, used for the testing of counterpoise and other weights, is not, perhaps, particularly well suited for use in connection with the testing of grease-measuring devices, on account of the large number of loose standard weights which it would be necessary continuously to utilize, and on account of the size of the container used to receive the lubricant discharged from the device under test. Some officials already have small scales which they use for the check weighing of package goods, and others could undoubtedly procure these if considered expedient; these scales should prove entirely satisfactory for use in testing a grease-measuring device.

To determine the weight per unit volume of the lubricant being dispensed from the particular device under examination, the inspector should be provided with a substantial metal cylindrical standard having a capacity of 2 or 4 pints, preferably the latter; the capacity of this measure should be defined by the top edge of the measure. Having first determined the weight of this measure when empty, or having "balanced it out" on the scale, the measure is filled level full of the lubricant and the net weight of the measured amount of lubricant determined; from this figure the weight per pint is readily found. This measure may then be emptied and cleaned, and need not be used again until the test of another grease-measuring device is undertaken.

Any convenient container may now be used to receive the discharge from the grease-measuring device, and this container need not be cleaned between successive observations, because its tare weight can be determined prior to each discharge from the grease-measuring device and the net weight of each discharge readily computed from this tare weight and gross weight after discharge, or the container may be "balanced out" before each discharge and the amount of the discharge weighed net. From the weight per pint of lubricant the inspector can readily compute the weight representing the tolerance for a delivery of any nominal amount, and this may be easily applied and a decision quickly arrived at as to compliance or noncompliance with the tolerances. It is the ease with which errors of discharge may be computed and tolerances applied by the weight method which particularly recommends this method over the straight volumetric method in which it is necessary to determine errors and apply tolerances volumetrically; the principal objection to the weight method

Digitized by Google

is the necessity for accurate determinations of the weight per unit volume.

Experience may show that the inspector may with safety simplify the weight method of testing grease-measuring devices by eliminating the individual determinations of the weight per pint of the lubricant each time a test is undertaken, and proceeding upon values for this vital factor which have been determined in his office for lubricants of different grades and makes. Perhaps one series of values might be worked out for average summer temperatures, and another for the average temperatures which may be anticipated for spring and fall; in winter testing, different grades of lubricant would be encountered as compared with those in use during the warmer portions of the year, and values for these might be worked out for a temperature corresponding to that of the average filling-station office or garage. I am not as yet prepared to recommend this method of procedure, because I do not know the magnitude of the errors which might be introduced; but if it can be shown that such errors are negligible, then there would be removed from the weight method of testing grease-measuring devices its principal objectionable feature.

In either the volumetric or gravimetric method of testing a grease-measuring device it is recommended that deliveries of at least 2 pints up to perhaps 4 or 5 pints be utilized, rather than deliveries of single pints. This recommendation is made because on a delivery of 4 pints, for example, the tolerance is approximately four times as great as on a 1-pint delivery and is susceptible of easier and more accurate application; another reason is that such deliveries will probably represent more nearly average performance of the device than a delivery of a single pint. If it is desired to check the accuracy of the device on the delivery of the first indicated pint, cause the device to discharge several "initial" pints, averaging the error on the total of these deliveries to arrive at the error of the initial pint. Methods of making other combination deliveries and of testing the discharge of the device at various points throughout its range whenever this is necessitated by the type of device under examination, will be obvious without detailed explanation.

DISCUSSION OF ABOVE PAPER

The CHAIRMAN. In inviting discussion of this paper, the chair would state that it is the practice of the conference to invite discussion from anyone present. Does anyone wish to discuss this paper?

Mr. RAGLAND. Mr. President, I was deeply interested in this rather technical paper presented by Mr. Smith. I think it was good, but he did not mention two things that I think should have been mentioned. In relation to chassis lubrication, we do not care about it. They have all kinds of guns to do it. Mr. Smith said that the amount of grease or oil dispensed does not fix the charge assessed for such greasing operation as the cost of the lubricant was relatively unimportant compared with the cost of the servicing operation. In relation to greasing differentials and transmissions, I may say that it is not the cost of the material that goes in but it is the cost of the material that does not go in which is important. The cost of the grease is very small. Grease is obtainable at anywhere from 3 to 8 cents a pound.

Digitized by Google

That does not make much difference in the cost of the job, but it makes a world of difference if the grease does not go into the transmission and you have stripped gears, and all kinds of trouble. That is what I am considering. If I have a bad tooth I can not see it, but when I go to the dentist I want him to tell me what is going on.

When we go to a service station we supply our deputies with half-pint, pint, and quart containers. They go in and turn a handle and if the device is correct they know it. We never would make as many inspections if we had to use gasoline everywhere to clean the measures. But it is a simple affair to carry these extra containers, and you can tell immediately whether a pump is correct or not. You do not dirty your hands and you do not have to have scales. We can do much quicker work, insure more inspections, and thereby assure people of getting full measure in grease deliveries.

Mr. ROGERS. Mr. Chairman, testing grease-measuring devices is a dirty job as everybody knows, but we found out an advantageous method. There is a type of cylindrical container which we have approved for various measurements of ice creams and liquids. We find those containers very well within the limits of tolerance at all times, and so they can be used for testing without detriment to accuracy. A number of these can be secured—they come in half-pints, pints, and quarts, just the sizes in which the grease-measuring devices are graduated. By using these you make a test that is very accurate and you will not have all that cleaning of a good standard to go through each time.

Mr. SAYBOLT. Mr. President, just a point for Mr. Smith's consideration. His paper was very valuable. The point I would like to make is that if this gravimetric method be pursued, based on volumetrically filling a container, it must be remembered that there is always a certain amount of aeration that will apply in plastic materials, and some method would have to be developed to eliminate this aeration.

The CHAIRMAN. I would like to say in relation to our next item that many of the weights and measures officials here do not have any direct supervision over cotton. However, cotton is of tremendous importance in the Southern States, and the standardization effort, which will be discussed by Mr. Palmer, represents a large program, which should be of interest to all weights and measures officials in this conference.

THE SALE OF COTTON BY NET WEIGHT AND THE STANDARDIZATION OF THE BALE

By ARTHUR W. PALMER, *Chief, Division of Cotton Marketing, Bureau of Agricultural Economics, United States Department of Agriculture*

The cotton crop of the world is marketed in containers of different kinds, but in the United States the package unit of lint cotton is the bale. This has been true with no observed exception since the virtual disappearance from production of sea-island cotton, a select part of which was until about 10 years ago sent to the mills in bags.

The American bale is of two general types, one the round bale and the other the so-called square bale. There are substantial differences between the two. The round bale is packaged in a round-bale press

Digitized by Google

which is attached to the gin in place of the usual square press box. A few round presses turn out bales of 500 pounds, but the usual round bale is about 250 pounds, or half the weight of the square bale. It is 35 inches in height, 22 inches in diameter, has a density of about 28 pounds a cubic foot, and is completely covered with about 2½ pounds of closely woven burlap cloth. The weight of covering is usually calculated without controversy at 1 per cent of the gross weight.

The story of the round bale is one of the romantic chapters in American cotton history. From nearly a million running bales reported by the Census Bureau in 1902 the round-bale production fell to about 58,000 in 1914, a year in which the crop was of record size. The present round-bale press is a development of the last 20 years, during which it has undergone modification and improvement. Production of round bales has shown a rather consistent increase since 1914. In that year round-bale production was 58,000 running bales, and counting round as half bales was about two-tenths of 1 per cent of the crop. By 1928 it had reached about 675,000 running bales, or $2\frac{8}{10}$ per cent of the crop.

Many advantages are claimed for the round bale. It occupies, however, a position which is somewhat special owing to the fact that the press patents have been closely held and that distribution of the round-bale production has rested very largely in the hands of those responsible for its development. Recently the round-bale press, of which formerly only the use was licensed, has been offered for sale. Were, in addition, a more universal market to develop for cotton in this form, the round-bale package would doubtless command a wider interest. The remaining discussion relates to the square bale, which is the form in which about 97 to 98 per cent of the crop is packaged at the present time.

The square bale as it is originally formed at the gin is variously described as a gin bale, a country bale, or a flat bale. The grower brings to the gin a load of seed cotton which has been weighed as picked and which is calculated to gin out one, two, or more even bales without overplus. The wagonload is weighed, and the cotton is generally drawn by suction into the gin. If the load contains more than one bale the ginner undertakes to switch the flow of cotton from one press box to another so as to make the bales of about even weight. In general, the effort is to make a bale which weighs about 500 pounds gross, but this is only approximate. In a study made in 1924–25 bales were found to vary from 300 to 700 pounds. Of about 6,000 bales examined in Texas, approximately 79 per cent fell in the range 450 to 550 pounds, with about 14 per cent heavier than 550 pounds and 7 per cent lighter than 450 pounds. Of 2,061 bales examined in Georgia, about 58 per cent fell in the range 450 to 550 pounds, with 12 per cent heavier than 550 pounds and 30 per cent lighter than 450 pounds. In Mississippi, of about 2,000 bales examined, 45 per cent fell within the range, 14 per cent above, and 41 per cent below.

The gin bale takes the dimensions of the press box and comes out about 54 inches long, 27 inches in thickness, and 48 inches in breadth. With pressures ordinarily obtainable, the density is about 12 to 15 pounds to the cubic foot of volume. The bale is covered on two of its sides and on the ends with a covering usually of heavy jute cloth, cut into two strips, each 3 yards, more or less, in length. It is bound

Digitized by Google

sometimes with five, but usually with six ties, ordinarily of 19 to 19½ gage steel, $\frac{5}{16}$ of an inch wide and about 11½ feet long, weighing sometimes 2 pounds each, but customarily 1½ pounds. The total weight of ties on the gin bale thus closely approximates 9 pounds. The weight of bagging aims generally at about 12 pounds, but may run from 5 to 20 pounds. Total tare weight of the gin bale—that is to say, the weight of the covering materials—has been rather traditionally set by the markets at 21 pounds, but it often varies several pounds either way from this figure.

As the bale runs the market gauntlet to the mill it undergoes sampling from time to time. In the sampling operation the bagging between the bands is cut and several layers of lint are pulled out.

To economize in transportation costs, gin bales are assembled near their points of origin at compresses where they undergo total pressures ranging up to about 2,000 tons. In this process their volume is reduced by about one-half. There are two degrees of compression, the so-called standard compression, and high compression. The standard compressed bale is elongated to about 56 inches, widened to about 28 inches, but reduced in thickness to about 18 inches. Its density is increased to about 22 to 28 pounds the cubic foot. It retains its original bagging but is given eight bands. These bands are shortened to 8½ feet, but the increase in number with the buckles keeps the total weight of bands at about 9 pounds. As a measure of protection and to reduce fire hazards, sample holes in the bagging are covered with patches which in most cases are applied to either side. The total weight of patches varies but usually ranges from 4 to 8 pounds.

Cotton which reaches the ports destined for export shipment is often further compressed to high density to take advantage of lower ocean freight rates. The high density compression pressures are about the same as for standard density compression, but by closing the press on the ends and sides the bale is narrowed a few inches and molded into a more symmetrical and substantial package. At the same time its density is increased to about 28 to 40 pounds the cubic foot, depending upon its weight. The original bagging is retained. Patches may be changed or added at this time. The high-density bale is given nine ties which are shortened to 7½ feet and their total weight remains still very close to 9 pounds, equalling the weight of the six bands on the gin bale and of the eight bands on the standard compressed bale.

Although cotton to the value of a billion and a quarter to a billion and a half dollars goes to market every year in square bales, the square-bale package is not in step with the rhythm of American progress. In a rough way it serves its purpose but its weaknesses continue to be, as for many years past, the subject of friendly reproach from our customers in overseas markets. Its rents and tatters and soiled contents in the company of neater-dressed bales from other countries are an embarrassment to ourselves.

That the packaging of our raw cotton presents a genuine problem has long been realized. Its various phases have had attention of capable students from time to time in the past, and certain recognized improvements have been made. Among these improvements should be mentioned standardization of the dimensions of gin press

Digitized by Google

boxes during the World War. The development of high-density compression, which so far as is yet known is accomplished without injury to the spinning properties of the fiber, is another.

And yet, notwithstanding the study and the efforts that have been given to the problem, the square bale taken by and large falls short of being a satisfactory package. Some of its shortcomings, in particular, are:

First, inadequate protection of the contents due to the use of bagging materials which fail to withstand the wear and tear of shipment, resulting in waste and damage of the contents.

Second, ragged unattractiveness of appearance due to the same causes.

Third, lack of uniformity in the weight of tare, resulting in uncertainty of the actual net weight of the contents and the consequent necessity of opening and stripping bales in the process of distribution.

Fourth, overtaring, due principally to the operation of present trading rules and the difficulty of determining under present conditions the weight of covering materials when once they have been applied to the bale.

Fifth, lack of even approximate uniformity in weight of contents.

To keep within the allowable time limits it has seemed desirable in this paper to hold the discussion rather strictly to questions of tare weights, with some reference also to protection of contents, and to leave for another occasion the consideration of bale weights, which present problems even more difficult.

From the descriptions given earlier it will be observed that since the weight of bands upon the bale remains for practical purposes uniform, whether the package be in the form of a gin bale or be compressed to standard density or to high density, the causes of variations in the weight of tare are due principally to the bagging and patches. Variation in the weight of bagging and patches is due to several different causes: First, the weight per yard of the materials used is variable. Figures obtained for the three years 1926, 1927, 1928, indicate that in that period about 58 per cent of the crop was covered with new jute bagging weighing about 2 pounds a yard, about 11 per cent with rewoven bagging of approximately the same weight, about 25 per cent with reclaimed sugar-bag cloth weighing about 1⅝ to 1¾ pounds a yard, and about 6 per cent with second-hand bagging of very uncertain weight. Second, the yardage of bagging applied to the bale is variable. The ginner does not usually obtain bagging in the exact lengths in which it is to be applied to the bale, but in rolls from which the gin tender cuts for each bale two pieces, each supposed to be about 3 yards long but which may be considerably longer or shorter.

One of the most important contributing factors to variation in tare weights is found in the diversity of trade rules governing settlement weights and tare. In domestic business cotton is bought and sold on the basis of the gross weight of the bale. American mill rules allow 4.4 per cent of tare on uncompressed cotton and 4.8 per cent on compressed cotton, but in 1925 more than 20 different trade rules governing weight of tare were found besides the State laws, which in eight cases differed from each other. Cotton which is exported,

Digitized by Google

however, is sold on a basis of its gross weight less 6 per cent. Methods of calculating tare are not uniform in various markets, but, in general, each 100 bales is required to have not to exceed 900 pounds of bands and a weight of bagging equal to $3\frac{0}{16}$ per cent of the total weight of the 100 bales less the weight of the bands. One could go much further in detailing the intricacies of applying the rules on underweight bales or overtared shipments. The important thing to observe, however, is that when a bale of cotton which leaves the gin covered with 21 pounds, more or less, reaches a domestic mill in compressed form it may, if it weighs 500 pounds gross, carry 24 pounds of tare, but if it goes into export markets it may carry 26.2 pounds of tare. Franchise provisions in some of the markets and weighing technique allow this weight to be increased by another pound or more.

The differences in the weights of tare between the gin bale and the compressed bale as it reaches its mill destination either in this country or abroad is made up by the weight of patches which are added to the bale at the time of compressing. The added pounds of patches cost less than the equivalent weight of cotton sells for. The cheaper the patch, the greater the profit. So it happens that the diversity of tare rules in different markets has some curious consequences.

In examining these consequences it should be observed, first of all, that as a general proposition price competition in the cotton trade obliges the seller in any market to add the last pound of tare that the traffic will bear. Otherwise his competitor may be depended upon to do so, and by counting the profit in the patch weights put himself in position to undersell and get the business. The seller is handicapped, however, because unless he tests the tare of the cotton before shipping it he is not in position to know, possibly within several pounds, what the original tare weight of each bale was. Furthermore, he starts with bales of different weights, and even if the original covering on each bale were of uniform weight, the tare weights would not be equal percentages of the gross weights of the bales. The safe thing to do, therefore, is to add patches sufficiently heavy to be sure that he has availed himself of all his rights. If the seller in his effort to bring the tare weight up to the allowable maximum exceeds the limit, the buyer may, if he thinks fit, test the weight of tare and claim reimbursement for the excess. Testing the tare involves opening and stripping a part of the bales, usually 10 per cent, weighing the tare, and recompressing the bales. It is a tolerably expensive operation. Usually the arrangement is that if the buyer challenges and the bales prove not to be overtared the buyer must pay the expense of the test. If the shipment is overtared the seller pays this cost. In some markets it is rather customary for buyers as a protection to their interests to tare a large part of the shipments received. This is a charge upon distribution which the American cotton crop has to bear.

The entanglement of tare weights with sales prices may result also in another unfortunate competitive situation. Reputable merchants, whose business ethics hold them to strict observance of the rules, point out that, in competing for the business of a buyer who is tolerant of overtare, they can be undersold by a competitor who will shade his price and compensate himself by patching to exceed the tare limit.

Digitized by Google

Another charge upon the handling of the crop is in the additional handling and storage charges which the diverse tare rules entail. As pointed out above, cotton going to export markets may carry heavier patches than that which goes to domestic mills. If unsold cotton is compressed to conserve storage space awaiting sale, the owner must decide whether to apply the lighter domestic patches or the heavier export patches. If light patches are put on and the cotton is exported, it generally has to stand the expense of being again compressed to have the heavier patches put on. If export patches are put on and the cotton is sold in this country it must sustain freight and other charges on excess weight.

To many people the task has seemed almost hopeless of this great industry's changing its habits so that in place of raggedness and damage cotton might have cover and protection; that in place of a selling system confused and involved with a tare procedure as complex as can be conceived there might be a clean-cut merchandising system for its distribution; that in place of adding to the crop an unneeded weight of covering the package could conform to its proper purpose, namely, to contain and protect its contents through the various processes of distribution. Others who have given thought to the problem feel that it is not incapable of solution if an intelligent attack is made upon its causes. Of these there are many who believe that a great part of the problem might be solved if all trading were based on net weights. There is, however, an understandable and, perhaps, justifiable hesitation on the part of cotton people to approve the net-weight principle unless coupled with some measure which will make obvious the actual tare on any bale of cotton at any time. This means either tare standards or the actual tare weight branded on each bale. Without detailing its disadvantages, the latter alternative may be dismissed as impracticable. Tare standards may, therefore, be regarded as a prerequisite to net-weight trading.

There is reason to believe that the use of bagging and patches definitely conforming to fixed standards of weight ought to remove any necessity which may now exist for building up the gross weight of bales with more or heavier patches than are actually needed to afford protection to bale weights, with savings in the cost of materials, of freight, of insurance, of interest, and of adjusting and collecting buyers' claims for overtare. It should facilitate the handling of the cotton crop by permitting cotton to be compressed and stored without regard to the question of whether it is to be ultimately sent to domestic or foreign mills. It would seem to promote fair trading by putting sellers on even terms with each other so far as tare advantages are concerned. By protecting buyers from the impositions of overtare it should eliminate the expense of stripping and repressing bales in the taring process.

Whether a single fabric or even a single material could be prescribed as standard is open to some doubt. For a crop of 15,000,000 bales, 90,000,000 yards of bagging and about 35,000,000 yards of patches are required. Too severe limitation of covering materials would tend to raise the cost of the material designated as standard and increase the cost of covering the crop. There is no reason, however, why standards which would specify constructions, dimensions,

Digitized by Google

and weights might not be fixed for several kinds of bagging materials, provided the materials were different enough to be positively and easily distinguishable.

With selling prices calculated on net weights there would be no advantage in using heavy bagging materials or disadvantage in using light bagging. Whichever material was the cheapest at any given time would be used at that time, and the cost of baling the crop could follow the lines of greatest economy. Were bagging and patch standards to include in addition strength requirements, it is believed that the destruction of bagging which now occurs so frequently in shipment could be minimized with consequent increase in protection of the contents and improved appearance of the package.

One factor which doubtless delays the change from gross to net weights is the apparent difficulty of making the transition. At whatever time tare standards might be established there would presumably be in the world upward of 2,500,000 bales of American cotton of nonuniform covering and tare, the merchandizing of which on net weights would be impracticable. To effect the transition without undue hardship a sufficient period of time should be permitted to elapse between the time when all newly ginned cotton would carry standard tare and the time when net-weight trading became effective. Some modification of trading rules on American cotton throughout the world would also be necessary to accommodate the change. This, however, seems to offer no great difficulty inasmuch as representatives of foreign markets have already expressed their willingness to cooperate in this way whenever in this country we are ready to go forward.

The thought has occasionally been expressed that cotton growers being thoroughly accustomed to selling their cotton by gross weight would resent a change to net-weight selling which would compel the deduction of the weight of tare in the settlement. To the extent that growers are not informed of market practices and methods of calculating prices such an attitude might be expected. When, however, it is realized that the total money consideration given for a bale of cotton which is sold in export on its net weight is not less than that given in this country when bought on its gross weight; that the lack of standards for tare and gross weight selling are productive of unnecessary costs of distribution; and that every unnecessary item of cost reduces by that amount the share of the consumer's dollar which remains for him, the grower may be depended upon to appreciate the advantages of net weights. The simplification and savings which tare standards and net-weight trading promise are sufficient to commend them to all who are interested in increasing cotton marketing efficiency and reducing its costs.

(During the presentation of this paper, Mr. Palmer illustrated by means of lantern slides a number of the matters discussed.)

DISCUSSION OF ABOVE PAPER

Mr. SWEENEY. Mr. Chairman, may I ask as to whether they weigh that cotton before or after it is pressed?

Mr. PALMER. The wagonload of cotton is weighed before it goes into the gin. The bale is pressed in the gin press, is then covered, and comes out; then it is weighed again.

Digitized by Google

Mr. SWEENEY. Why could you not establish an approximate weight of material used in the tare, have a standard approximate weight for a bale of cotton, and require that a certain percentage or poundage be deducted for the tare. For instance, if the material you put on that cotton weighs 9 or 10 pounds, and if the bale weighed 400 pounds, gross, then you would immediately deduct 10 pounds for the tare and have a net weight of 390 pounds. Thereby you would have a uniform condition covering baled cotton.

Mr. STOVALL. Has the United States Department of Agriculture ever conducted any experiments as to the moisture content of jute bagging? They tell us you can not wrap jute bagging without sprinkling it and when you put it in the sun it will lose as much as 4 or 5 pounds. Do you think that much moisture should go in jute bagging?

Mr. PALMER. I think not.

Mr. STOVALL. We get some bagging that looks as if it had been dipped.

The CHAIRMAN. In reference to the next paper I would remind the members of the conference that we have one or more papers from representatives of industries in which the weights and measures officials are especially concerned. Paul E. Hadlick is secretary of the division of marketing of the American Petroleum Institute. Prior to his connection with the institute he was associated for six years with the State Oil Men's Association of Minnesota; during that period he had frequent contact with the Minnesota department of weights and measures, and is, accordingly, no stranger to the activities or the viewpoint of the weights and measures officials. Mr. Hadlick will speak this afternoon with particular reference to regulations relating to grease-measuring devices.

COOPERATION WITH WEIGHTS AND MEASURES OFFICIALS

By PAUL E. HADLICK, *Representing the American Petroleum Institute*

Mr. Chairman and members of the conference, I come before you gentlemen to-day as a representative of the American Petroleum Institute. This institute, as you may know, represents 95 per cent of the refining capacity of the oil industry. It is the trade association of the oil industry with membership in every State in the Union. Having been in Minnesota and worked with Oscar Smith for many years I know the burdens of the State inspectors, and we at all times have tried to help one another so that our burdens would be lightened, and I hope that the oil men throughout the country work with you gentlemen. If there is ever occasion where there seems to be unnecessary friction, I know you can call on me and I shall try to eliminate it at once, because it not only hinders your work, but it hinders the progress of the industry and defeats the purpose of your laws relating to weights and measures.

Recently the American Petroleum Institute divided its activities into the branches of production, refining, and marketing. Thus the institute is equipped to consider directly, and we hope efficiently, any problems in relation to marketing—of which the matter of establishing accurate weighing and measuring devices for petroleum products is one. It is the ambition of our division of marketing to

Digitized by Google

work with you gentlemen that accurate measure of petroleum products may always be assured, and that the burdens placed upon you and your personnel may be lightened.

As secretary of the division of marketing of the American Petroleum Institute, I am in contact with the operating personnel of practically all of the oil companies who make up our membership. The division of marketing is accorded the position of official spokesman for the oil industry when matters pertaining to marketing problems are approached. As such spokesman, it becomes my duty to appear before you gentlemen in an official capacity and present the views of the industry on a matter of vital importance.

The demand for grease-measuring devices comes only for the serving of grease in the differential and transmission of automotive equipment. This was brought out by Mr. Smith in his paper. If we go back a number of years we will find that it was customary to set a barrel of grease on the curbstone in front of a garage, or at the service station, and serve the grease direct to the differential and transmission from such barrel through a hand-operated pump. Then there were developed hand-operated dispensing units for the 100-pound drum and the 400-pound barrel, and the hand-operated 25-pound grease bucket, as a matter of convenience to operators. For, perhaps, the last 10 years these three hand-operated dispensing pumps on the 400-pound barrel, the 100-pound drum, and the 25-pound bucket, have been the standard equipment for the dispensing of grease into differential and transmission by the oil industry. The grease dispensed by such equipment was first sold by the pound, and later by the shot or stroke.

Two years ago when the code of specifications and tolerances for grease-measuring devices was first proposed, the oil industry welcomed any suggested changes that would enable them to render a better public service. A year ago a group of oil men, through the American Petroleum Institute, met with one of your committees and not only approved the fundamentals of the code, but made several valuable suggestions that were incorporated in the code as finally adopted. I think that fact indicates the attitude of the oil industry, which has traditionally been one of working with you people in a constructive manner. We are with you again to-day in the same spirit of cooperation.

I have talked with a great many members of the American Petroleum Institute recently. These conversations bear out the following facts:

1. That since the adoption of the proposed code at your last conference a number of large oil companies have made a diligent effort to secure grease-measuring equipment that complied with the code, and which would be favorably passed upon by the State sealers.

2. That as far back as January certain large oil companies announced through communications to the equipment manufacturers that it was their desire to anticipate the effective date of your code by then purchasing suitable equipment.

3. That as late as March of this year there were only two companies that produced equipment which they claimed complied with the code. Only one of these manufacturers could supply the three

Digitized by Google

necessary types of dispensing equipment; the other company could only supply one of the three types commonly used in the industry. Furthermore, both companies claim their equipment is protected by basic patents.

4. Within the last 60 days two other manufacturers have brought on the market units which they claim have been submitted to some of the State sealers for approval. Within this short space of time the oil industry has not had the opportunity to put the equipment in use or test it to determine its accuracy, efficiency, and dependability.

5. At this very moment, so far as we are able to ascertain, no equipment manufacturer has a complete line of hand-operated equipment comprising the three necessary units, namely, the 400-pound barrel, the 100-pound drum, and the 25-pound bucket, that have been approved by any State east of the Rocky Mountains.

6. It is our understanding that a number of equipment manufacturers have encountered mechanical and other difficulties in endeavoring to perfect the grease-measuring units to comply with the code as well as securing the approval of the State sealers.

7. To put the code into effect this coming July 1 would be tantamount to forcing the oil companies to equip their stations and dealers with equipment that, considered in the most charitable light, is still in an experimental stage.

8. The oil industry has purchased some of the present units on the market, and is willing to purchase more of them when they are approved by sealers, and aid the equipment companies in their experimental work so that difficulties inherent in the manufacture of any radical new equipment may be overcome.

9. If the proposed code becomes effective July 1, it could not be complied with in a general way because no manufacturer is able to furnish a complete line, the supply of equipment would be grossly inadequate, and its production would be in the hands of so few companies as to exclude the oil companies from purchasing such equipment in a proper competitive market.

The oil industry welcomes any code, however drastic the requirements may be, so long as such a code is uniformly interpreted by the various sealers and promotes better public service.

The oil industry, through the American Petroleum Institute, has always worked along the lines of assuring the public of accurate measure, of aiding the State sealers and the Bureau of Standards in promoting better public service. We, therefore, only ask that a reasonable postponement of the effective date of the code of specifications and tolerances for grease-measuring devices be granted in order that the equipment manufacturers may develop, perfect, and secure the sealers' approval of hand-operated grease-dispensing units to comply with your code.

In view of the facts presented above, and the cooperation that at all times has been extended by the oil industry, we feel that it is only just and proper for this body to grant a reasonable extension of time as requested.

Gentlemen, I am very thankful for your very kind attention. Thank you.

Digitized by Google

DISCUSSION OF ABOVE PAPER

Mr. RAGLAND. Mr. Chairman, this is a matter of importance, and I have some questions which I would like Mr. Hadlick to answer. Mr. Hadlick, in 1928 this conference adopted tentative specifications. Was not the American Petroleum Institute familiar with those tentative specifications?

Mr. HADLICK. I believe they were; yes.

Mr. RAGLAND. Yes, they were; and now you come here and tell us that the oil men "do not believe." Excuse me. We do not care what the oil men believe; we are working in the public interest. You set out in your magazine what you believe.

Mr. HADLICK. Mr. Ragland, let me answer your question. We have nothing to hide. The publicity was sent out that the oil men were coming down to ask for an extension. If there is anything underhanded about that, I would like to know it. The publicity was prepared in my office. If we had said nothing about it and came down without advance notice before this body and asked for an extension of time, I think we might be taking an unfair advantage. We stand on the merits of my proposition.

Mr. RAGLAND. Did we not give you 13 months to get ready for the enforcement of these specifications?

Mr. HADLICK. We have tried. We can not make the equipment. We are not in the equipment business.

Mr. RAGLAND. What efforts have you made to buy the equipment?

Mr. HADLICK. We have asked the equipment people for it.

Mr. RAGLAND. I can show you that my bureau has approved as many as 10 equipments.

Mr. HADLICK. Are you speaking of the air-operated equipment?

Mr. RAGLAND. I am speaking of the specifications which require that all grease-measuring devices must be equipped with an indicator so that one can determine in pints the amount of grease delivered.

Mr. HADLICK. I think you are taking a very antagonistic view of this. I am perfectly open and above board.

Mr. RAGLAND. All right. May I ask what companies have made efforts since the last conference to comply with these regulations, other than in Richmond? The companies are doing it in Richmond.

Mr. HADLICK. Yes; I can tell that a great many companies are in the market for the equipment, but are they to buy it when it is altogether in the experimental stage? Richmond is not the only place in the United States, Mr. Ragland.

Mr. RAGLAND. I feel that it is. Certainly we have evidence of this—that Richmond has approved as satisfactory 12 or 14 different grease-measuring devices. What oil companies have made appropriations for equipment? Have you made any appropriation for them?

Mr. HADLICK. I could not ask you to speak for the State of Virginia or the city of Richmond, except in your capacity. Now, I am not in the operating department of any company. I am in the American Petroleum Institute. However, I will be glad to call upon representatives of the various companies who are here, and they will be glad to answer your question.

Mr. RAGLAND. How many companies have continued to put out old-style equipment, regardless of our specifications?

Digitized by Google

Mr. HADLICK. I do not know. I will say that there is no desire on the part of the oil companies to increase the amount of equipment of the old style at this time. I know companies that have discontinued purchasing, who would rather put in new equipment.

Mr. RAGLAND. You know companies are now holding up contracts to see what we will do to-day.

Mr. HADLICK. You do not blame them.

Mr. RAGLAND. Do you know that since 1928, through my good friend, Mr. Fuller, the grease proposition has been enforced in California?

Mr. HADLICK. I believe that is right.

Mr. RAGLAND. You said there were two or three units that you knew of. Are there not more than three?

Mr. HADLICK. I do not know that there are more than three.

Mr. RAGLAND. You ought to know. Look at them [handing paper]; there they are.

Mr. HADLICK. You tell me. The city of Richmond is but one city in the United States. What company, for example, do you know of that can supply the dealers with approved units to serve from 25-pound, 100-pound, and 400-pound containers? What company is putting out a full line that has had the approval of all of the States, or if it has had the approval of some of the States, what States are they?

Mr. RAGLAND. I will not name companies. I am not advertising them.

Is there any oil company that you know of that could not get approved grease-measuring equipment because the manufacturers could not guarantee delivery?

Mr. HADLICK. I will refer you to one of the purchasing agents. Mr. Malone, can you answer that question? I am not trying to pass the buck, but trying to get some information for you.

Mr. MALONE. I can answer your question by saying there is not a company that could supply the industry to-day with sufficient equipment that would enable it to comply with the code as of July 1, 1930.

Mr. RAGLAND. Have you tried to buy this equipment?

Mr. MALONE. Yes; we have tried to buy. Will you please name to me any concern that has these three pumps, approved by State sealers east of the Rocky Mountains?

Mr. RAGLAND. I am not going to advertise.

Mr. MALONE. We are very much interested.

Mr. RAGLAND. Do you know of any oil companies that wanted to make contracts for needed grease equipment during the past three months that the manufacturers refused to accept on account of not being able to handle the business?

Mr. MALONE. Yes; our company announced as far back as January of this year that we were willing then to invest our money in equipment that would pass the approval of State sealers in the district where we operate. We have yet to find any company that can furnish the three units that we are talking about.

Mr. RAGLAND. Why do the companies figure that they will require a large number of pieces of apparatus when they are permitted to use equipment already installed in the field?

Digitized by Google

Mr. MALONE. You know that when any new piece of equipment comes on the market everybody wants it. When the new equipment comes on the market, approved by all State sealers, everybody will want it, and that automatically obsoletes all other equipment.

Mr. RAGLAND. I think I have made it perfectly clear that this is a smoke screen.

Mr. HADLICK. If the Chair will permit, Mr. Ragland has brought up some questions and innuendos and inferences of unfairness and I do not like it.

Mr. Malone has a list which comprises all of the manufacturers of grease-measuring equipment known to Mr. Holbrook. I added some companies that I had and Mr. Malone carried on a long correspondence with those companies. I think Mr. Holbrook has the original correspondence. I said I thought only two or three were ready to furnish equipment complying with specifications. Mr. Ragland talks as though there are a dozen. I would like Mr. Malone to read the list.

(SECRETARY'S NOTE.—In the discussion which follows, the names of a number of manufacturers of grease-measuring equipment were mentioned. Since it is not considered advisable to include these names in the record they have been deleted.)

Mr. MALONE. The firm first on the list is a general contractor and apparently have bought patents held by another company. They have no literature describing the equipment.

Mr. GRIFFITH. What is the date of that correspondence?

Mr. MALONE. This correspondence starts March 14 and ends April 23, 1930.

Mr. RAGLAND. That is a rather late date to start.

Mr. MALONE. No; I wrote Mr. Holbrook on March 4 and told him that after diligent effort we found nobody who could supply us with the equipment that would meet the various State requirements. Mr. Holbrook countered, telling me that he was quite surprised, that he understood through trade papers that some concerns were prepared to furnish proper equipment. He mentioned that he had a list comprising the names of some 32 companies in all who manufactured grease equipment. I wrote back and told him I would appreciate his sending me the names of the 32 and that I would be glad to canvass each one of them and see what they had to offer. That was done, and Mr. Holbrook has my original file. Now, this, that I am reading, is a résumé of what we found at that time.

The next company on the list has apparently discontinued the manufacture of grease guns. The equipment manufactured by the next company is an air container, using air pressure with meter. The next company does not manufacture measuring equipment; they apparently are not familiar with the specifications nor interested in the manufacture of equipment in compliance.

The next company does not manufacture meter equipment and apparently does not intend to be "bothered with new requirements," as they put it in their letter.

The only equipment the next company has to offer is a portable air-operated unit for lubricating pin fittings, and this is not the type of equipment we have under discussion. The next has a pressure grease tank which could not be used in places where a grease pump

Digitized by Google

and so-called 100-pound units have been used in the past without a tremendous increase in investment. The next is not in position to furnish equipment as they were under direct contract for their entire output. The equipment of the next company is also air operated. The next company is manufacturing only a high-pressure grease gun, and has not any grease-measuring devices ready for release. The equipment of the next company is also air operated. The next company principally manufactures garage equipment. Their grease bucket has no measuring device.

The next company apparently has no equipment in production but seems to be the only concern that is interested in the manufacture of grease-measuring devices that could be placed on each of the present grease containers. The next two companies do not manufacture grease-measuring devices. The next company was the only concern that was marketing equipment similar to equipment used to-day, with the addition of an indicating device, but they only had approval on the west coast. The next are strictly jobbers handling lubricating equipment manufactured by others. The next was the only concern that could produce the three units that we speak of, and they had, at that time, the approval of only five State sealers and of the city of Richmond.

Mr. RAGLAND. That alone ought to put it over.

Mr. MALONE. The next company does not manufacture grease-measuring devices. The next unit is air operated and has not been approved by all the States. The next company contemplates building differential grease pumps, but had nothing to offer at that time. They have since come out—on May 14—with an advertisement that they have a piece of equipment; they go on to say it is not in production and it will pay to wait.

The next letter best illustrates the trouble that the manufacturers have in producing equipment. At the present time they have nothing to offer. The next company replied in answer to a letter addressed to another company. They did not have anything to offer, but are jobbing the unit of another manufacturer. The next does not manufacture any grease-dispensing units to meet the specifications of the National Conference on Weights and Measures.

There were four more concerns that we wrote on four different occasions, but we have not had a word from any one of them.

Now, if you will permit me, to bring this down to date, since our efforts to get equipment there has been quite an effort—in the last 60 days—to bring something out in a hurry. That has been done by the outfit that you have approved at Richmond.

Mr. RAGLAND. I will prove there are more than that.

Mr. MALONE. I am perfectly willing to be shown, and you will have your time later.

These people, as late as May 21, turned over to an eastern company the right to manufacture their apparatus, but to this minute they have not secured approval, with the exception of the city of Richmond, east of the Rockies.

There is one other concern that has one unit of the three that we are talking about, that fits into a 100-pound drum that has received the approval of five States and the city of Richmond. There is another concern, which I mentioned, that can produce the three, but as yet has only produced two of the three, and has submitted them

Digitized by Google

to not more than three States. They have secured, to my knowledge, the approval of the bucket and the 100-pound drum. I would be very glad to know of any other manufacturer that has equipment of the type we are talking about.

Mr. RAGLAND. You mentioned the ——— company. Did you try to place a contract with that company.

Mr. MALONE. That is not the type of equipment we are looking for.

Mr. RAGLAND. And the kind of equipment we want is the kind of equipment that the specifications demand; that is, a grease device equipped with auxiliary equipment to determine in pints the amount of grease dispensed. Have you tried to buy the ——— equipment?

Mr. MALONE. We have, for you, down in Richmond. Where else has it been approved?

Mr. RAGLAND. Have you tried the ———?

Mr. MALONE. That is a separate meter.

Mr. RAGLAND. Have you tried the ——— company?

Mr. MALONE. Yes; I have read what they said.

Mr. RAGLAND. There [indicating] is the approval of that gun.

Mr. MALONE. Those are all your approvals. As we said before, we do not sell only in Richmond, but all over the country.

Mr. RAGLAND. When you try to throw a smoke barrier——

Mr. SAYBOLT (interposing). Pardon me. You imply an unfairness on the part of the Petroleum Institute which I think is unfair, and I take an exception to it. You can not back up your charge of unfairness on the part of the Petroleum Institute.

Mr. RAGLAND. I can prove any statement you want to mention.

Doctor Burgess, I do not care to take up any time in further discussion, and I will make a motion now that the conference on weights and measures in session here to-day refuses to put up with this postponement on one cause or another; that we will not have any postponement but that the program, as adopted last year, effective July 1, 1930, shall go into effect.

The CHAIRMAN. I am afraid, Mr. Ragland, your motion is not in order.

Mr. BAKER. Mr. Chairman, I would like to say in defense of Mr. Hadlick and Mr. Malone, that it has been very difficult to know how the specifications would be interpreted and what will satisfy the sealers of weights and measures—what sort of device it will take to meet the requirements. I think if it is definitely understood what sort of device is required, that will clear up the situation. I think it is lack of this knowledge that has prevented the manufacturers from going ahead.

Mr. MARONEY. Mr. Chairman, we are very fortunate in having with us to-day an engineer of a large company, whose letters are on file here. I believe he can give a synopsis of what has been done.

The CHAIRMAN. I would be very glad to hear from him.

Mr. CARRIGER. Mr. Chairman and gentlemen of the conference, in case you do not understand my position, I feel that in fairness I should state that I represent a manufacturing company. As a representative of that company, I am compelled to support Mr. Malone in the statements he has made. Up to the present time we have not been able to develop the devices required by the industry to meet the

Digitized by Google

specifications of the code. This is not because we have not tried—we have spent thousands of dollars—but because of lack of time we have been unable to get around to the various sealers and obtain a general universal interpretation of what the code demanded. We made devices and took them to one sealer and, perhaps, would get his tentative approval. In the next State approval might be refused. Acting on the suggestion of the second man we would add something to the device and receive his approval. However, when we went to the third man he might disapprove the device.

The people in Washington have been very fair, and I think they will bear me out when I say that it is possible that an amendment will be added to these specifications, and I submit that the specifications were not clear or they would not have to submit an amendment at this time.

There is no intention on our part, as manufacturers, to delay the manufacture of grease-dispensing devices that will meet the requirements of the oil companies and come within the code, because manufacturing equipment is our business. When we can make them we can sell them. When we sell them sometimes we make some money. That is how we exist, and I feel that I must support Mr. Malone with all the force at my command. Our failure to get equipment on the market has not been due to lack of diligence, but to our inability to get a clear understanding of what was wanted. We want to make devices complying with a broad interpretation of the code.

We are here seeking knowledge. We came down to get an idea of what you want. We are going back to our plant and, gentlemen, we are going to develop grease outfits just as quickly as we can and just as well as we can; we want them to be as perfect as we can make them and within the rulings of the code.

Mr. GRIFFITH. Mr. Chairman, I would like to ask the gentleman if the regulations and specifications that were promulgated here two years ago did not make it clear to him what was desired. Did we not tell you what we want?

Mr. CARRIGER. The specifications were not clear to us, and the opinions of the sealers bear me out.

Mr. RAGLAND. Did you fail to understand what we wanted or was it a doubt as to what the Petroleum Institute wanted?

Mr. CARRIGER. The latter phase was not given consideration. Our sole endeavor was to get something that the sealers wanted.

Mr. GRIFFITH. Those specifications were promulgated after due deliberation; a year elapsed and they were reiterated with a tentative specification added. Now I would like to ask Mr. Smith a question. Mr. Smith, in your paper you mentioned some 10 different types. I would like to ask if any of those complied with the specifications.

Mr. SMITH. As I stated in my paper, no effort was made in my analysis to determine whether or not the units discussed were in compliance with the code of the conference. The idea of my paper was to describe what is on the market and how the various units operate.

Mr. GRIFFITH. In your unofficial observation did you make note as to which complied with specifications?

Digitized by Google

Mr. SMITH. I would not be prepared to say from my unofficial observation whether any of them did or did not.

Mr. GRIFFITH. I think there are some other grease-measuring device manufacturers represented here and it might be well to hear from some of them who have successfully met the specifications. While I have heard the speakers through, pro and con, I want to say that in Baltimore, Md., there are five different machines for dispensing grease which, according to my interpretation, comply with the specifications, and that will be approved as long as they measure accurately.

Mr. RAGLAND. I would like to ask Mr. Carriger whether his company did not instruct their salesmen not to try to sell grease-measuring devices because there is no profit in it.

Mr. CARRIGER. No; that is not true.

Mr. RAGLAND. Doctor Burgess, I want to make this statement and then I am through.

I attended this conference last year. I went before the committee. We had a very pleasant talk—they are a bunch of very sensible men—and they said to me—

Ragland, you are premature. We are going to put these specifications out as they are, and we are going to put a footnote at the end of the code, to read as follows:

"GENERAL NOTE.—*Device to indicate exhaustion of supply.*—The conference goes on record to the effect that it is its opinion that such a device as is mentioned in the following paragraph is a very desirable one, but considers that the time is not yet ripe to recommend its adoption. The conference suggests, however, that at some future time steps may be taken to incorporate the following paragraph in the code of specifications.

"All grease-measuring devices shall be provided with a device which will make the unit inoperable when the supply of grease or transmission oil has reached a point where the accuracy of delivery would be affected, or shall be so constructed as to warn the purchaser and the operator in a conspicuous and distinct manner that the level of the supply is so low as to endanger the accuracy of the measurement."

We have put you on notice. The Bureau of Standards has had this printed and we have done everything we could. I believe you have judgment and confidence in my judgment. I believe all the time that is necessary has been allowed, and I am going to close by telling you that I know there will be no postponement.

Mr. FULLER. I would like to say to the delegates that in California, where we have already put these specifications into effect, there are eight or nine devices complying fully with these specifications, and I can assure you that we put them to as thorough a test as would be required anywhere.

Mr. SPAETH. Mr. Chairman and gentlemen, I have no objection to the new specifications from the manufacturer's standpoint. I think it should be required to sell commodities by weights and measures absolutely, and if the requirement is that you must do it, that is all there is to it.

Now you gentlemen know that when you have a 100-pound drum, and it is 33 or 25 per cent empty, and a man comes in for 10 pints or 10 pounds, nine times out of ten the grease does not flow, and unless the operator wants to be honest he will give you about 7 pounds instead of 10 pounds due to sucking up air. I have tried it from A to Z. Now, here is a thing I wrote up yesterday in a hurry:

Digitized by Google

What are the problems in dispensing differential and transmission grease from a customer's and operator's standpoint, as compared with oil? In the first place, a customer specifies and receives a predetermined quantity of oil and has positive means to check the operator, which is impossible when it comes to purchasing transmission grease. He simply states, "Fill up my transmission or differential," without knowing the amount required or received. Now what is the operator up against? When dispensing oil, he has positive means to check up his quantity in storage, in the form of a gage stick. He uses visible means, such as a measure or bottle, and simply counts the number of quarts or pints he transfers to the crank case—without a counter, by the way.

What about grease? I have prepared a few questions and answers in this relation which I will read. "Can a customer specify the quantity of grease to be purchased?" The answer is "No." "Has the customer a positive means to check up the operator to determine the quantity received and paid for?" The answer is "No." "Has the operator positive means to check his supply?" The answer is "No." "Why not?" The answer is, "The container may be half full along sides and at a minimum at intake or there may be air pockets in the grease."

"Is material dispensed by visible means?" Answer—"No." "Has operator positive means to show what transpires when turning crank handle back and forth?" Answer—"No." "Why not?" "It is practically impossible to check supply, and delivery is made by invisible means and from invisible supply." "Will a counter or meter attached to crank-type pump measure correctly?" Answer—"No." "Why not?" Answer—"For the reason that they register pump strokes only." "Is a counter for individual sales now used?" Answer—"Such is proposed." "Will it have any bearing on correct measure?" Answer—"No."

In conclusion, since it is the accepted practice to purchase all commodities by either weights or measures, and since the transactions are supervised by State departments of weights and measures, the first consideration should be to devise a device that will eliminate the unknown quantities outlined above. The addition of various accessories to present-day equipment, such as meter and counter, will not solve problems at hand, and simply means a bill of expense to the operator without accomplishing the object.

Now, what is the answer? The answer is to provide visible means to show the customer and operator that grease is dispensed 100 per cent with definite visible means to show that supply is not exhausted. The answer is the last paragraph in last year's specifications and that is the only answer to this problem that will be perfectly fair to both the customer and the operator.

Mr. BARRETT. Mr. Chairman and gentlemen, what I have to say is this: In answer to the comments you have just heard, it is granted that the devices which are now available do not in every case indicate when the supply reaches exhaustion, and that is a condition that has not yet been perfected. Still, are we to fail to go halfway, or rather fail to go three-fourths of the way, because we can not go all

Digitized by Google

the way? Let us adopt what we can do and work for what we can hope for in the future.

Another point is this: The statement has been made by various companies that none of the equipment manufacturers to-day manufacture all three of the kinds of equipment needed. I can not speak positively as to this, but I do not believe that is of particular importance. If we can not get all three from one company we can get one kind of equipment from one company and from another we can get another kind. The fact is, I do not know of any of the larger companies who get all of their equipment exclusively from one pump manufacturer; so they only suppose that they must purchase all of their 25-pound, 100-pound, and 400-pound equipment from one manufacturer.

In connection with the availability of equipment that meets the specifications, I realize that the oil companies have various problems, not the least of which is the securing of equipment at modest prices. Sometimes that is a very predominating problem, under marketing conditions; but I do know that equipment is manufactured which meets the specifications laid down by this conference last year. When these regulations were proposed last year that type of equipment was available in large quantities. It is now being sold in lots of thousands of units, and it can be sold in many times the quantity that it is now being sold. I do know that there are manufacturers—my own company included—who make devices in accordance with the specifications of every State which requires such approval, and that, I think, is the answer to the discussion that has been brought up this afternoon. Equipment is available that meets the specifications. Now, whether it meets the requirements of price is another question, although here again, the price, I believe, is very modest and offers a not insurmountable obstacle.

Mr. HADLICK. Do you put out equipment to comply with specifications?

Mr. BARRETT. We manufacture meters only.

Mr. HADLICK. Has your meter been approved in every State?

Mr. BARRETT. Yes; in every State in which approval is now required.

Mr. HADLICK. How many States?

Mr. BARRETT. To the best of my knowledge, California, Massachusetts, Virginia, Vermont, and other States that I know require specific approval.

Mr. HADLICK. What companies have you sold them to?

Mr. BARRETT. Principally to three, but there are a half dozen others who are purchasing in greater or less quantities.

The code specifically mentions that while it is desirable to indicate exhaustion of supply this is not insisted upon at present. Therefore, our meter complies with the code.

May I mention this point, which I think is essential. The elimination of air presents quite a problem. Any meter which is to record must be a positive displacement meter. It is very natural, therefore, that it will register air the same as grease. Therefore, the solution of the problem is to avoid the registration of air by keeping

Digitized by Google

all air out of the meter line and that is the function of the tank or the bucket in which the meter is set. That can be done by means that are now available, as many of you will agree.

Mr. RAGLAND. Do you not think the oil companies in the United States, if they had wanted to comply with the specifications, could have gotten all the equipment needed and a little more besides?

Mr. BARRETT. You have made a point that I had hoped would be brought up. We have found a lack of interest on the part of the grease customers.

Mr. TINKEY. I would like to state that this code of specifications and tolerances for grease-measuring devices was adopted tentatively by the conference in 1928 and, after considerable discussion, it was agreed that the code should not become effective before July 1, 1930. Now, I would like to explain that in Ohio when we decided on the date of July 1, 1930, to adopt the code permanently, that did not means that on July 2 everybody would have to have a measuring device to correspond with the code. We did not expect that. But we expected grease-measuring devices, in compliance with the code, would be put into service and that, perhaps, during the next year there would be many more. Now is not that fair?

Mr. HADLICK. Yes; but automatically every dealer will want them.

Mr. TINKEY. And we will approve them as fast as we can.

The CHAIRMAN. The author of the paper asked for a postponement of the date for the putting into effect of the code of specifications and tolerances for grease-measuring devices. Is there any member of the conference that would care to make a motion on that point?

(No motion was made.)

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON MODIFICATION OF SPECIFICATIONS FOR GREASE-MEASURING DEVICES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN

Your Committee on Specifications and Tolerances has reviewed the code on grease-measuring devices and has only one amendment to propose, namely, an amendment to specification No. 3 in relation to "indication of delivery."

The first portion of this specification now reads as follows:

3. INDICATION OF DELIVERY.—All grease-measuring devices shall be so designed and constructed that the initial zero condition and the amount delivered in terms of liquid measure shall be clearly and definitely indicated by automatic means * * *.

It is now recommended that the specification be amended to read as follows:

3. INDICATION OF DELIVERY.—All grease-measuring devices shall be so designed and constructed that the initial zero condition and the total amount delivered to an individual purchaser shall be clearly and definitely indicated in terms of liquid measure * by automatic means: Provided, however, That the capacity of the registering or tallying device demanded by the above shall not be required to be more than 5 pints: And provided further, That a device in use at the time these specifications take effect shall not be required to comply with the above requirement for automatic indication of the amount delivered when the device delivers, within the tolerances hereinafter provided, a unit quantity of a pint, a multiple of the pint, or a binary submultiple of the pint per stroke or per cycle of its operating elements, and when, in addition, the device is conspicuously or permanently marked to indicate the value of this unit quantity.

Digitized by Google

* NOTE.—Devices which at the time of adoption of these regulations in any jurisdiction are marked to deliver in pounds rather than in pints and which in other respects conform to the retroactive sections of this code or are susceptible of being made so to conform, should not be condemned and confiscated on this ground alone, but the word "pound" should be obliterated wherever it occurs and the word "pint" substituted therefor. In this case the device should be readjusted if necessary.

NOTE.—The requirement for a tallying device, contained in the foregoing specification, shall not be put into force and effect prior to July 1, 1931.

(Signed) F. S. HOLBROOK, *Chairman.*
I. L. MILLER,
A. W. SCHWARTZ,
CHARLES M. FULLER,
Committee on Specifications and Tolerances.

Mr. RAGLAND. I move that the report of the committee be adopted.

(The motion was seconded, the question was taken, and the motion was agreed to.)

(At this point, at 4.57 o'clock p. m., the conference adjourned to meet at 10 o'clock a. m., Wednesday, June 4, 1930.)

Digitized by Google

THIRD SESSION (MORNING OF WEDNESDAY, JUNE 4, 1930)

The conference reassembled at 10.06 o'clock a. m., at the Bureau of Standards, Dr. George K. Burgess, president, in the chair.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON SPECIFICATIONS AND TOLERANCES FOR ODOMETERS, PRESENTED BY F. S. HOLBROOK, CHAIRMAN

Your committee on specifications and tolerances was requested last year to prepare a code of specifications and tolerances for odometers, which are machines for measuring the distance traveled by vehicles, especially automobiles, to which they are attached. These machines are of several general types. One type of odometer, called the hubodometer, is attached directly to the hub of the vehicle; another odometer, which may be mounted on the instrument board or elsewhere about the vehicle, is driven by a cable attached to the transmission or to a front wheel; a third is the mileage-recording portion of a "speedometer" assembly of the usual type.

Of course, as weights and measures officials, you will be interested in only a few of the odometers in use. Obviously you will not be concerned with odometers on private cars. However, odometers are frequently used commercially, and they may be put to uses which may be designated as quasi-commercial; for instance, under the following conditions: (1) An odometer on a "drive-yourself" car, when the charge made for the hire of the vehicle is based, wholly or partly, on the number of miles traveled by the vehicle and registered by the odometer; (2) an odometer which may be used, in some jurisdictions, in regular taxicab service; (3) an odometer used for the purpose of determining the amount to be paid for liability insurance, when the liability insurance is not on a basis of a flat rate per car but is on a basis of miles traveled; (4) an odometer used for the purpose of the assessment of taxes when a tax against a public vehicle for the use of city or State roads is on a mileage basis. It is such uses as the above which may bring the instrument within the jurisdiction of the weights and measures official and which make advisable the adoption of a code of specifications and tolerances.

Copies of the recommendations of your committee have already been placed in your hands.

In accordance with the usual custom, words shown in italics are intended to be nonretroactive. As in the case of all new codes, your committee recommends this code for tentative adoption only.

Respectfully submitted.

(Signed) F. S. Holbrook, *Chairman*,
A. W. Schwartz,
Charles M. Fuller,
I. L. Miller,
Committee on Specifications and Tolerances.

Digitized by Google

DISCUSSION OF ABOVE REPORT

Mr. HOLBROOK. The introductory material, the definition, and specification No. 1 read as follows:

NOTES.—The following specifications and tolerances shall apply to odometers in those cases in which odometers are used or to be used commercially—that is, to determine charges for hire of a vehicle—and such use shall be permitted only when these specifications and tolerances are complied with. Whenever odometer readings form the basis for the payment of fees or taxes to or for the preparation of reports for governmental agencies, for the determination of insurance premiums, or in other such cases, and weights and measures officials undertake to inspect and test such odometers, what follows is recommended as the basis for such examinations; the requirements should be applied in so far as they are applicable and not modified by the conditions surrounding the special use.

It is strongly urged that compliance with the tolerances be determined by the performance of the complete assembly installed on the vehicle with which it is to be used, in a road test over a measured course. During such test the vehicle shall carry an average load and the tires shall be inflated to normal pressure recommended by the manufacturer of the tires.

It is recognized that physical limitations, such as very heavy traffic conditions in the vicinity of the place where the tests of odometers must be made, may in certain instances preclude the possibility of the road test recommended. Necessarily in such cases some other method of test must be resorted to. The only other method of test which is at all adequate is that known as the "wheel test," which is a test of the entire odometer assembly when mounted upon a vehicle, the mechanism being actuated by the mechanical revolution of the vehicle wheel while the car remains at rest. The corresponding vehicle travel can be computed when the rolling circumference of the tire on the wheel of the vehicle which actuates the odometer, under average load and with normal tire inflation, is accurately known, and this computed travel can be compared with the registration of the device. Specially constructed apparatus will be necessary if the test is to be made in this way.

The "bench test" is believed to be inadequate for odometer assemblies and is not recommended.

After approval of the complete assembly, suitable seals shall be applied so that no part of the odometer mechanism or of the connections leading thereto may be removed, or modified in such a way as to affect the accuracy of registration, without destroying or mutilating the seal or seals.

Whenever an odometer has been damaged, whenever repairs which might in any way affect the accuracy of its registration have been made, or whenever any of the official seals have been destroyed or mutilated, such odometer shall not thereafter be used commercially until inspected and, if deemed necessary, tested by the weights and measures official.

Definition.—An odometer is a mechanism or machine designed to be attached permanently to a vehicle and adapted automatically to register the distance traversed by the vehicle. For the purpose of these specifications and tolerances, this definition shall be construed to include hubodometers, cable-driven odometers, and the mileage-recording, or odometer, portions of the so-called "speedometer" assemblies for automobiles.

Specifications.—1. CHARACTER OF INDICATION.—Odometers shall be so designed and constructed that they will register in terms of miles *and tenth-miles.*

The CHAIRMAN. Our usual procedure is to act on the several items as these are read. If that is your pleasure, we will adopt that procedure.

Mr. SWEENEY. Mr. Chairman, I move that the portion which has been read be adopted.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK (reading):

2. MOVEMENT OF INDICATORS.—All odometers shall be so designed and constructed that when installed on a vehicle the registration of the odometer shall be susceptible of increase only by the rotation of the vehicle wheel or wheels.

Digitized by Google

The tenth-mile indicator may advance continuously or intermittently; other indicators shall advance intermittently. In all cases in which indicators advance intermittently, movement shall be communicated to the indicator drum or dial only during that period in which the advance of the mechanism corresponding to not more than the one-tenth mile immediately preceding the next higher indication, is taking place. An odometer may be provided with means for reducing the registration to zero.

Mr. FOSTER. Mr. President, it seems to me it might save time to dispense with adoption section by section. Comments can be made on each section as read and then at the conclusion a vote can be taken on the whole report.

The CHAIRMAN. If there is no objection on the part of the conference, it is agreed that we will vote on the whole code when the reading is concluded.

Mr. STEVENS. Mr. Chairman, there is one comment I would like to make at this time. There is nothing in there which prevents an odometer being run backward and the registration thereby decreased to reduce taxes or insurance premiums. It seems desirable to specify that the registration of the odometer should not be susceptible of being decreased by running it backward. In other words, there should be some sort of device included so that if the wheels are turned backward this will not decrease the record.

Mr. HOLBROOK. In relation to that, the committee had in mind that when these odometers are used for fixing insurance premiums or for taxation purposes this code is only to be applied in so far as it is applicable, and the special use shall govern the details of the construction. For instance, this specification allows the registration of an odometer to be reduced to zero, but such a provision should certainly not apply to an odometer to be used for insurance or tax-collection purposes. However, in the case of odometers used on "drive-yourself" cars, for instance, the committee sees no reason why, if such a construction is desired, the odometer might not be so constructed as to allow it to be turned back to zero at the beginning of every hiring. Obviously, in that event the companies operating these cars would select an instrument so constructed that a customer could not reduce the record before returning the machine to the owner; a special key might be required, for instance.

Such special uses have been provided for in the introductory notes by the language:

Whenever odometer readings form the basis for the payment of fees or taxes to or for the preparation of reports for governmental agencies, for the determination of insurance premiums, or in other such cases, and weights and measures officials undertake to inspect and test such odometers, what follows is recommended as the basis for such examinations; the requirements should be applied in so far as they are applicable and not modified by the conditions surrounding the special use.

Mr. HOLBROOK (reading):

3. READABILITY OF INDICATIONS.—Mileage figures and the apertures through which they are viewed shall be of such size, design, and location that the indications of the odometer may be easily and accurately read. The figures and their backgrounds shall be of sharply contrasting colors; the color of all fingers except those indicating tenth-miles shall be uniform, and the color of the tenth-mile figures shall be different from the color of the other figures. Except during the period of advance of an indicator to the next higher indication, only one figure on each drum or dial shall be exposed to view. Any protective covering intended to be transparent shall be in such condition that it can be made transparent by ordinary cleaning of its exposed surface.

Digitized by Google

4. VISIBILITY OF REGISTRATION.—Whenever an odometer is utilized upon a vehicle in lieu of and for the purposes for which a taximeter is commonly employed in regular taxicab service, the odometer shall be so positioned on the vehicle that the registration of the device is in full view from the interior of the vehicle; in all other cases the odometer shall be so positioned that it is readily accessible for the reading of its registration.

5. PROVISION FOR SEALING.—Adequate provision shall be made for sealing in place all complete odometer assemblies—that is, installations upon vehicles of odometers and the various gears and other parts required for service operation—in such a manner that no adjustments, replacements of or to any parts of such assemblies, or alterations, which might affect in any way the accuracy of the odometer registration, can be made without destroying or mutilating the seal or seals.

The seal or seals required by the provisions of this specification shall be so applied that they are visible; that is, it shall not be necessary to disassemble or remove any part of the vehicle or odometer to determine whether such seals are intact.

6. PERMANENCE.—*Odometers shall be of such design, construction, and materials that they may reasonably be expected to withstand ordinary usage without impairment of their accuracy or the correct functioning of their operating and indicating parts. This specification shall be construed to require that in the case of ratchets and pawls and similar combinations, wherever the accuracy or consistency of the indications of the odometer would be affected by the wearing away or the deformation of one or both of the cooperating parts, the ratchets and pawls shall be fabricated of such material and shall be hardened to such a degree and extent that the wear or deformation resulting from use will be reduced to a minimum.*

7. FRAUDULENT CONSTRUCTION.—All odometers and all mechanisms and devices designed to be attached thereto and used in connection therewith shall be of such design and construction and shall be so installed for use that they do not facilitate the perpetration of fraud.

Tolerances.—The tolerances to be allowed on the registration of odometers with respect to distance actually traversed or computed shall be as follows:

Tolerance in deficiency (overregistration): None, except when the vehicle tires are seriously worn in which case 1 per cent of the interval under test shall be allowed.

Tolerance in excess (underregistration): Four per cent of the interval under test.

The CHAIRMAN. Gentlemen, you have heard this report. What is your pleasure?

Mr. FOSTER. Mr. Chairman, I move that the report be adopted tentatively as recommended by the committee.

(The motion was seconded, the question was taken, and the motion was agreed to.)

The CHAIRMAN. Gentlemen, we have the great pleasure to-day of listening to a man in the House of Representatives who is charged with the scrutinizing of proposed legislation relating to coinage, weights, and measures introduced in the House of Representatives.

I have the honor of introducing the Hon. Randolph Perkins, chairman, Committee on Coinage, Weights, and Measures, House of Representatives.

ADDRESS BY THE CHAIRMAN OF THE COMMITTEE ON COINAGE, WEIGHTS, AND MEASURES, HOUSE OF REPRESENTATIVES, HON. RANDOLPH PERKINS

Mr. Director and gentlemen of the convention, when I listened so attentively to the paper on specifications and tolerances for odometers, I thought perhaps the next speaker might say something on specifications and tolerances for Congressmen, because it is a very weighty matter when the chairman of the Committee on Coinage, Weights, and Measures meets with the National Conference on

Digitized by Google

Weights and Measures; but in view of the fact that this session of Congress is measurably reaching its conclusion, a spirit of levity rather than of weight prevails this morning with the speaker. I know the work that you gentlemen are doing to some extent, and I offer my hearty cooperation so far as I can give it. But it seems that this serious meeting and these serious papers might well be interrupted for a moment with a little less serious thought, perhaps intermingled with a little bit of philosophy.

If we were to have the tolerances suggested for Congressmen, perhaps we upon the Hill who are doing what we can with the little light we have to help in the standardization and the passage of laws in reference to weights and measures might be treated with a little tolerance when we consider matters not only of the head, but also of the heart. How a Congressman is viewed by the people throughout the country, generally, it is very difficult for those of us on the Hill to appreciate. Usually the American people we meet with are sufficiently polite to say reasonably good things of us, but that does not necessarily mean that we are taken as seriously as we are inclined to take ourselves.

* * * * * * *

Now I feel I am getting serious, and I do not intend to do that. The world at large seems to be distressed about the United States standardizing everything too much. We are worried least of all by standarization. Why, we have a doctor on the "hill" who goes around and measures the heads of Congressmen—that is, on the outside—trying to standardize Congressmen. I do not think we need worry about that type of standardization. As I see it, what we are trying to accomplish, what you are trying to accomplish, is the standardization of ponderable things—things that can be weighed and measured—and the standardization that we have in this country has resulted in the development of this tremendous prosperity, the greatest the country has ever had. But I do not think we will standardize a man's heart or head. We may ride in the same kind of a car. The car may be standardized, but what is going on inside of the man is far from being standardized. Moreover, what we want to escape is mental or emotional standardization.

* * * * * * *

In the last few years the whole world has taken on new aspects, I believe. A good part of our law came down from customary law, but now, of course, it is practically all enacted law and court decisions; but I say, gentlemen, as I read your papers and as I hear discussions before the committees of Congress, that alongside of enacted law there is growing up a great body of customary business practice in this country, and I dare say the very report which was just read is along the line of that business practice. That is a splendid thing, because men in business are beginning to learn that the real way to conduct business is to conduct it according to certain ethical practices. We, in this day, are beginning to realize the truth of the old saying that honesty is the best policy, and so there is growing up this great body of business practice on a strict ethical basis—men get together who are interested in the same subject, discuss their problems, read papers, and pass resolutions designed for the conduct of business on a high ethical plane

Digitized by Google

common to all; this, of course, is along the lines of standardization and has resulted in the elevation of business to a high level.

Now, the work that we are doing in Congress is, of course, just being done by human beings like yourselves. We realize that it is the most difficult thing in the world to pass remedial legislation. It is not difficult to see the wrong. It is not difficult to see where people are injured by existing conditions. The great difficulty is to find the proper remedy.

I think it was Mr. Huxley who said, "Give a man a thin sheet of metal with a bend in it; give him a hammer and tell him to straighten it out. Before he has it straightened out he will have a hundred dents in it."

The work that you gentlemen do is exceedingly helpful. In fact, it is the real work. We only attempt to crystallize into statutory form the thought and the conclusions of the bodies of men throughout the country who are giving various subjects their earnest consideration. Now, we do not move as fast as some would like, but I have often found in my own case that when I travel too fast I often have to retrace my steps somewhat.

I just want to say this concluding word, that it is a real pleasure to come and meet with you here. It is a splendid thing to see men who take their time, who use their energies and their brains, to bring about standardization of weights and measures—who deal with this broad subject. Why, you know, friends, the world does not realize what a large subject this is. Practically all of science is based on weights and measures, which means that practically all material advancement in the world is based on weights and measures. Sometimes, when I get a little philosophical, I begin to wonder if nature ever intended to have us civilized—I sometimes doubt it. Mankind has had such a hard struggle to attain to his present position. The work you are doing is a helpful illustration of the great effort of the scientist in the advancement of the human race.

I must say, gentlemen, that I honor your efforts, your energy, in coming here and dealing with these subjects which, to the outside world, are dry and, perhaps, uninteresting, but which, in the final analysis, enable the bulk of the people to advance, and enable your legislators to say what is necessary to assist the country in this great work of standardization of measures and of weights.

I want to say it is a real pleasure to have been with you, and I trust when another year rolls around that we will all be able to gather here and renew our friendship.

Mr. SWEENEY. Mr. President, I ask that a rising vote of thanks be given to the honorable gentleman for his address here this morning.

(The motion was seconded, the question was taken by a rising vote, and the motion was agreed to.)

SOME OBSERVATIONS ON WEIGHTS AND MEASURES ADMINISTRATION

By C. P. NORGORD, *Assistant Commissioner of Agriculture and Markets, State of New York*

Mr. Chairman and gentlemen, the subject of standards of weights and measures and their enforcement is one the importance of which the general public often fails to appreciate. When the head

Digitized by Google

of a family, however, has the experience of purchasing his winter's supply of coal or of paying for gasoline pumped into the tank of his car he has the opportunity to learn how helpless he is in the hands of the dealer and how dependent upon the agencies whose duty it is to enforce the delivery of correct weights and measures in business transactions.

Weights and measures enter into the everyday transactions of every mature individual and each family of the Nation. It is the basis of practically all agreements and contracts and the means of securing equity through them. The delivery of full weight and measure and the elimination of fraud have been and always will be the issue in every transaction from the inception of quantity determinations down to the present time.

Every government from the earliest time has found it necessary to establish standards and to enforce their use as a means of securing just and equitable dealings among its citizens and between them and the State. So fundamentally important has this matter seemed in the eyes of all people back to the most primitive times that the establishment of standards and their enforcement have been among most early nations a part of their religion and the duty of the priests. For this reason also the official standards have been preserved in temples under priestly care. This is seen among the Hebrews in the expression "the shekels of the sanctuary." There is also a record of weights and measures recorded in the Talmud. Many weights and measures standards have been found carefully protected in Greek temples, such as at the Temple of Demeter, of Ephesus, and of Aphrodite. At Rome the standards were kept at the capital in the Temple of Hercules.

Next to its religion, next to the personal health of its people, the most fundamental obligation of the State to its citizens has been that of securing justice among them through the establishment and enforcement of standards of weights and measures. This is exemplified in the emblem of justice, represented blindfolded, dealing out justice by means of a delicate balance.

As weights and measures officials we are therefore dealing with the most ancient and essential responsibility of the State. This historical precedent naturally led to the inclusion in the original Articles of Federation of all the power to fix standards of weights and measures throughout the thirteen original States. This power was later transferred to the Constitution in Article I, section 8, in the language: "The Congress shall have power * * * to coin money, regulate the value thereof * * * and fix the standard of weights and measures." This constitutional power authorizes the Federal Government to establish standards of weights and measures and keep them uniform throughout the Nation. That power and responsibility of the Government since 1901 has rested with the Bureau of Standards, Department of Commerce.

The action of 19 nations in establishing the International Bureau of Weights and Measures, in 1875, insured uniformity of standards of weights and measures among the nations of the world. Thus has provision been made for this important function and responsibility, not only for this Nation but for the world.

24342°—31——5

Digitized by Google

It has fallen to the individual States, counties, and municipalities to carry out the duty of supervising and enforcing the use of standards thus established. The States, in many instances, have also assumed responsibility in taking action to establish such standards and practices as have not been set up by the Federal Government, the same to remain until such time as the Federal Government assumes constitutional authority and thus supersedes State action. The problem before the State is, therefore, how best to organize and carry on and most effectively to enforce the use of standards of weights and measures. Two methods, at least, are practiced: (*a*) Enforcement by the State alone, through a force of inspectors entirely under State control, and (*b*) by local county and municipal agencies, under State supervision.

If we wish to carry out the historical democratic principle of home rule, local enforcement is the correct system. Local enforcement has, however, proven more desirable and effective in theory than in practice. It involves enforcement by an official upon his friends and relatives, from which he naturally shrinks. As a consequence, he often evades his responsibility and sidesteps his duty. Experience shows that local politics too often intervene to thwart justice and vigorous enforcement. Too often the position of sealer is handed out as a recognition for political service performed, or to be performed. In many instances also, municipal and county authorities do not appreciate the great importance to the community and its citizens of the sealer's office and of his work. Hence, far too meager salaries and support for the office are allowed for the full-time employment of good and adequate men to carry on the work.

On the whole, experience seems to indicate that enforcement by the State direct is far more certain, unbiased, and effective. Most of the older and more fully organized States, however, already have county and municipal systems, established under State supervision of one form or another. The practical question facing us, therefore, is how best to organize, supervise, and carry out the work through local administration under State supervision.

The questions naturally arise, Why should the State concern itself about local enforcement? Should the State not be satisfied with the kind of enforcement the local government sets up? Are not the local people entitled to determine for themselves what sort of weights and measures enforcement they wish and the amount of money they want to put into it?

Experience has shown that if this principle were carried out literally, particularly in the smaller places, a weights and measures service would result comparable with the quality and condition of jails and schoolhouses found in places where State supervision is not exercised. Improved social, economic, and health measures usually come to local communities from some responsible, specialized State or national agency. Such movements must be brought to those communities through education and, frequently, by the enforcement of State laws. In this way, the State frequently forces local communities and municipalities to tear down old antiquated jails and schoolhouses and build new and modern ones.

In the same way, if we are to have uniformity in the standards of weights and measures and their use throughout the Nation, the

Digitized by Google

States must bring to the local communities the standards of weights and measures, interest their local people in them, and get them to establish a county or municipal unit to care for the standards and enforce their use locally.

Experience has also shown that the State, after accomplishing this, can not go away and expect such a system to operate effectively by itself, but it must return to the locality from time to time to stimulate the activity of the local units. Thus must the State exercise constant supervision in order that each local county and municipality may continue to have that high class of service and protection which the most enlightened sections have and which it was the intention of the founders of our State and Nation, should prevail throughout the Nation. In this way is the principle of home rule adhered to, good home rule secured, and uniformity of standards and their use brought about. The question then arises, How extensive shall the State's supervision be and how great the authority of the State over the enforcement of the local units? In New York State, the law gives the commissioner of agriculture and markets charge of the State standards and requires him from time to time to check the condition of standards in local communities. It places upon him the power and authority to establish tolerances and to issue instructions to the county and city sealers binding upon them.

In the exercise of this supervisory authority and because of the inadequate salaries and frequent changes of officials due to political changes, demands from the local communities have come for the exercise of more authority by the commissioner in the selection of local sealers and the determination of the amount of local financial support which shall go toward the salary of the sealer and the support of his office. No satisfactory solution of the requests thus placed with the State has as yet been found. It remains an open and important question needing solution. Upon its proper solution, perhaps, depends to quite an extent the standard of enforcement of weights and measures in counties and in municipalities.

The method of exercising State supervision is one which needs careful study. The New York State law formerly provided that all cities and counties must be inspected at regular intervals, irrespective of the relative needs of the different localities throughout the State. This brought about the inspection of some places where the service was adequate and well supported, like New York, Buffalo, and Rochester, leaving an inadequate amount of the time of the inspectors to devote to supervising and aiding the weaker points that were really in need of help and supervision. As a consequence, the State of New York, by legislation, has now canceled that mechanical plan, leaving it to the discretion of the commissioner as to what places shall be inspected, how often, and how much time shall be given to each. Under this plan emphasis is now being put upon places where the enforcement is poor to the benefit of these places and the service in the State as a whole.

In many of the cities and counties of the State local officials are changed frequently. It has been an important part of the duty of the State to send well-prepared inspectors to train new men in the complicated duties of the sealer's office. This is considered a most

Digitized by Google

important and proper service of the State and much of the time of the inspectors is devoted to this form of service.

Then there are many cities where very inadequate salary and support are given the office of the sealer, in comparison with the size of the county or the city and the responsibility of the office. The city of Hudson, N. Y., for instance, with a population of 11,745, invests but $300 annually in its weights and measures office. The State is now concentrating its efforts in getting facts concerning the situation in that city and putting them up to the mayor and common council for the purpose of getting an adequate appropriation and a consequent proper service for this important city. Auburn, N. Y., a city of more than 36,000 population, until quite recently depended entirely upon the county sealer to protect its citizens in respect to the use of weights and measures. Consequently, the service was very inadequate, and the reports of State inspectors after investigation showed unusual discrepancies in the condition of weights and measures and their use. To-day, as a consequence of the activity of the State, there is a city sealer in Auburn with adequate salary and office equipment. Counties are often lax also in support of the work. One county in New York State has failed until the past year in establishing a sealer's office because of an agreement entered into between the two political parties in the board of supervisors not to allow such a measure to pass. Luckily at a recent session of the legislature a law was passed requiring the inspection of all new gasoline stations and pumps before they could be used. This caused such a demand upon the county board of supervisors that they could no longer hold to their agreement and they at last found it necessary to provide for a county sealer.

In this and in other ways does New York State give its attention to finding and improving the weak points of service on weights and measures in the counties and municipalities of the State. The result has been a noticeable improvement in the effectiveness of the service of the State.

The State has also found another form of stimulating activity on the part of local units, namely, by placing emphasis upon weights and measures as applied to some particular important commodity, by means of state-wide drives on such commodities. Outstanding among these have been drives made upon coal and gasoline. All of the inspectors of the State have been placed at work at certain seasons of the year on these two commodities, passing rapidly from one city or village to another and back again, at irregular intervals. These drives have also been accompanied by proper publicity of the conditions as found, and speedy and reasonably heavy penalties applied to offenders. The results have brought about a very satisfactory stimulation of the trade, as well as of the local sealers. One interesting point in connection with these drives is the fact that the requests for them came originally from the best representatives of the trade.

Another method applied in these drives has been that of inviting offenders to attend hearings held at department offices throughout the State, as soon as possible after the offender was caught. This has had the effect of making punishment swift and suited to the offense and has given an opportunity to meet the offender and to explain to him the provisions of the law and to convince him of their necessity.

Digitized by Google

Through these various methods it has been found possible to improve State supervision and service on weights and measures in New York State without the use of a very large or increased number of inspectors.

THE STANDARD CONTAINER ACT OF 1928

By. H. A. SPILMAN, *Senior Marketing Specialist, Bureau of Agricultural Economics, United States Department of Agriculture*

Mr. Chairman and gentlemen of the conference, since a representative of our office talked to you last year, the standard container act has become effective; so far as the penalty provisions are concerned that happened on November 1, 1929. We had a little more trouble at the time the act went into effect than we had expected to have due to the drought of last summer. The dry weather which prevailed over a wide section of the country resulted in the carrying over of a large number of nonstandard containers. This occurred principally in connection with the 14-quart hamper used in Connecticut and some other parts of New England and in northeastern Pennsylvania, and with the 28-quart hamper used in Florida and Mississippi. We received inquiries as to whether some arrangements could not be made to use these hampers up during the present season. Of course, there was only one answer—that there was no provision to waive the penalty provision. We realize this has worked a hardship in many instances. One man in Tennessee had ten thousand 28-quart hampers early in the season and could not dispose of them. Seventeen months, two growing seasons, had been allowed the parties affected to accommodate themselves to these provisions. But you gentlemen know the tendency of people to hang on to a short measure until the last minute it can be used.

The trouble in Connecticut with nonstandard containers was due to a misunderstanding. A lot of the Connecticut farmers felt they could continue to use them and it took 10 days' work of three of us to make some start toward clearing up the situation. We also found some trouble in the city market of Scranton, Pa. The dealers there said that they had been informed that they could use those measures.

Another difficulty occurred in Florida and was due more to the ignorance of the manufacturer than to intention. Hampers have their capacity determined to the upper edge of the inside hoop. In Florida it is customary to set the cover down so that it fits into the hamper. In Tennessee there is a tendency to have the cover on top. Naturally, if you take a basket that is intended to have a cover on top and you insert the cover it will be short and that has been where we have had trouble. We got one man in Florida with 50,000 that were short and we made him ship them up in Tennessee with covers large enough to fit outside. We would have put two factories into bankruptcy if we had not been tolerant, and we believe the solution we adopted was the proper one. We found one case in Pennsylvania in which 15-quart hampers had passed into the hands of farmers, after we had notified the manufacturer that they were short capacity. These hampers were made before the 1st of November, but had not been used. In some cases the farmers had paid for the hampers, and we did not care to see them suffer. In this case the manufacturer has agreed to replace all those nonstandard hampers with standards,

Digitized by Google

and our decision to prosecute is being held in abeyance until we find out what he is actually going to do.

We have had one or two cases of an evasion of the law on some types of containers and investigations are now in progress on those. We have accumulated considerable evidence against one individual, who is due, I think, for a surprise before long.

In our work on standard containers we have always had the cooperation of the manufacturers—we expect to have it in enforcing this law, and have had it to a great extent. The provision in this law that manufacturers must submit their specifications for approval has made fellows in the basket industry who formerly never thought anything about dimensions or specifications get down to brass tacks on that phase of the matter, and I believe that we will have very little trouble.

We have not had the cooperation of the manufacturers of basket machinery that we expected, and we found that certain were continuing to put out forms which when used by the basket manufacturers would not permit them to make proper size baskets. There is nothing in the law which will permit us to touch them. However, we hope it will be ironed out in time.

The provision in regard to the approval of specifications is responsible for the great bulk of the work in our office in the last two years. It has entailed the examination of 550 sets of specifications and the testing of 7,374 baskets to determine whether or not the manufacturers' baskets do live up to their specifications.

Now, of course, the department, under the standard container act of 1928, is doing considerable work, but that is not all that we do. We still have some testing under the standard container act of 1916, and figures show that from July 1, 1929, to May 7, 1930, we tested 1,191 containers under the standard container act of 1916 and 4,328 coming under the act of 1928, a total of 5,519. For a similar period last year 3,626 containers were tested. This mechanical work takes up considerable time, as those of you who have had experience testing baskets well know. Of course, there is nothing novel in our method of testing. We use bulk for bulk, as outlined by the Bureau of Standards, although we have special apparatus to quicken the work. Our methods, by the way, are described in a miscellaneous publication which came out last week, which was written at the suggestion of Mr. Miller, of Indiana, and which each one of you should receive. We think we have obtained a very complete list of sealers of weights and measures, and that publication will be sent out to you just as rapidly as envelopes can be addressed. If you do not receive one, please write in and let us know.

There are sometimes, of course, unfortunate developments which arise when new pieces of legislation are being put into effect. As Mr. Perkins said awhile ago, it is a very difficult thing to pass remedial legislation which is satisfactory to everybody and accomplishes everything you wish to accomplish, and which at the same time does not add some things which you do not want. That is true of this law. There are two things which we would like to see changed. One of them is the lack of a provision as to the marking of containers. It was in the bill at one time during its history. You know, however, that the bill hung fire for eight years before it

Digitized by Google

was passed, and was rewritten at almost every session of Congress. Thus at one time it contained a provision requiring the marking of all baskets which came within its purview. But at the insistence of a manufacturer of splint baskets, that was stricken out in committee and was never restored. Now, I believe we could secure the approval of the majority of manufacturers for the inclusion of such a provision and we believe marking would be highly desirable in order to assist the average local official who has had any experience with baskets at all in determining whether a basket is short in capacity. That is one of the ideas that we had when we started the administration of the law—that we should make as simple as possible the determination of whether or not baskets came within the standards. Thus far we have been able to give only tentative approval to baskets and no final approval can be made until we make tests on baskets from the ordinary run of production instead of tests on those made with their correctness and appliance to specifications especially in mind. After we have entirely completed the work of approving specifications, production tests on baskets can begin and this work will be started very shortly. We intend to give publicity to these results, and, as I said before, if markings were required, this would not only simplify the identification of the manufacturers of baskets but we would make possible a much closer and highly desired cooperation between the State and local officials and the Federal department.

We have gone as far as we could under the regulations. We have provided a method of marking which a manufacturer may use if he wishes. We did that on the ground that since the manufacturer was required to submit his specifications for approval he should be permitted to indicate in some way that approval had been obtained. Most of the manufacturers, will, I think, avail themselves of that method of marking, but the manufacturers of splint baskets, which need marking most, have shown some disposition not to do that. Of course, any basket manufacturer objects to anything which increases the cost of operation. With machinemade baskets it is comparatively easy to develop a method of marking by machinery in some state of the process and not add greatly to the cost. Splint baskets, however, are almost all handmade and are sold on a very close margin, and these manufacturers, naturally, have rather consistently objected to marking. In fact, it was a splint-basket manufacturer who caused this requirement to be taken out of the bill several years ago. We believe that the law would be bettered were it to be amended so as to require marking, and, as I have stated, we believe the majority of the manufacturers would support some such proposal.

There is one other matter in connection with this law which I know you have thought over a good deal, some of you perhaps, in bitterness of spirit. It appears according to the lawyers, that this law did something that no one thought it would do. We have had occasion to seek interpretation of several points of the law from the Solicitor of the Department of Agriculture. In one of the general opinions which he gave us, he used certain language which made it seem that inadvertently this law tends to nullify a great deal of the work that has been done over a long period of years in the bringing

Digitized by Google

about of sales by weight, or the sealing and certification of dry measures where these are employed. Nothing, of course, was further from the minds of those of the Department of Agriculture who were interested in this matter, than any such development. The Bureau of Agricultural Economics, while it has never believed in sales by weight per bushel—a matter which was discussed here last year—has always believed in retail sales by weight or by numerical count. In a Farmers' Bulletin which we issued several years ago we called particular attention to the Massachusetts law on the subject—the law which has since been enacted also by New Jersey and Indiana, possibly by other States—which specifically requires sales by weight or count, except when in the original container.

We believe it would be a tragedy to have this law used by anyone in an attempt to evade State or local laws requiring sales by weight, or sales by standard dry measure. Certainly none of us would argue for a moment that it would be proper to take a standard hamper or a standard bushel basket and use it over and over again as a measure for fruits and vegetables. We do not believe that is the proper use of that sort of a container. Neither do we believe that so sensible a proposition as sales by weight at retail should give way to sales in which small baskets are used as measures over and over again. Now, we have kept pretty quiet about that interpretation of this law, but we found that some dealers in some markets apparently were smarter than we were. They saw the loophole before we did, and we heard from some few of the weights and measures officials that use was made of it. We have attempted as far as possible to discourage such use of the law, and Mr. Carey and myself, representing our bureau, and Mr. Holbrook and Mr. Smith, representing the Bureau of Standards, have had several conferences in an effort to draw up an amendment to this law which would safeguard everything which we wish to accomplish by the law and which would, at the same time, safeguard what has been accomplished by weights and measures officials throughout the United States in bringing about sales by weight.

We have again found it is a little hard to draw up something which says what you want to say and does not have other implications. The Bureau of Standards proposed the first amendment; we countered with another one; then a lawyer produced a third; after we got through we concluded that all we had accomplished was to kill the act without making certain we had done what we had intended. We finally put three suggested drafts up to the Solicitor of the Department of Agriculture and have been waiting prayerfully, hoping for some action from that office. It happens that that part of the solicitor's office has been very busy for the past few months on court work, and I regret to say that they have not got anything definite that I can present to you to-day.

I do, however, want to arouse your interest in the matter, and hope that we fellows in the Bureau of Standards and Bureau of Agricultural Economics will have your interest and hearty support.

The CHAIRMAN. The subject of the standard container act of 1928 is one of very great importance to this conference, and we are indebted to Mr. Spilman for his clarifying statements. After we hear from Secretary Klein, we will open the meeting for discussion of this item.

Digitized by Google

I am glad to say that Secretary Klein, of the Department of Commerce, has just come in. Most of you know that he was Director of the Bureau of Foreign and Domestic Commerce after having served his apprenticeship in several foreign stations; he is the Assistant Secretary of Commerce during the present administration. There is no one man in the department whose name stands for more in commerce than Doctor Klein. Doctor Klein, I may say to you that your audience here is an audience of representatives from 27 States and several departments of the Federal Government.

ADDRESS BY THE ASSISTANT SECRETARY OF COMMERCE, HON. JULIUS KLEIN

Doctor Burgess and ladies and gentlemen, I need hardly say that I feel honored indeed to have been given this opportunity of greeting you in behalf of the Department of Commerce, and of having at least a glimpse of your proceedings out here. We in the department, as Doctor Burgess has told you, feel particularly complimented when busy officials and business men take time away from their troubles and cares and come down here to Washington, and we have provided as warm a welcome for them as has been possible.

The importance of your problem, the familiar question of the uniformity of weights and measures, is perhaps best typified by this very institution which we are now visiting. The Bureau of Standards had its origin as the custodian of the weights and measures of the country. You have only to look around you, noting the amazing proportions to which this institution has risen, to get some grasp of the profound significance of the weights and measures problem, because that, as I have said, was the germ out of which this vast and invaluable organization has developed. Furthermore, the bureau illustrates to a peculiar degree the chief purpose of your conference, namely, collaboration between industry and Government, not solely Federal Government but State and local government; and there we have, again, in the bureau, an admirable illustration of the necessity for that type of detailed work. Government in these days can not sit down and arbitrarily rule and order things. To an increasing degree, thoughtful persons have been realizing through the past few decades (and more particularly in this period since the war) the prime necessity of keeping Government in close contact with industry; and this bureau stands as an excellent illustration of that type of thing applied to the realm of reality, making sure that Government does take its orders from industry and commerce and that it does provide practical and concrete service.

Of course, you can not get very far in that principle unless you keep assured of a reasonable degree of organization within industry. In a country as vast as this, and with as complicated an economic system as we have, it would be manifestly impossible for any governmental agency to accomplish its objective if it had to deal with each individual firm or each individual person engaged in certain lines of industry or trade. You must have organizations to deal with, and that is one reason why we are so fortunate in this country, because the American is "organization minded," so to speak. Of course, it is the pet diversion of our professional critics at home and

Digitized by Google

abroad to weep mournful, melancholy tears because the American is gregarious to such an extent that we might put two Americans on a desert island and they would immediately organize a chamber of commerce, or a Kiwanis Club, or some other get-together group. There is undoubtedly a great deal of back slapping and "elbow greasing" of that sort, but these 13,000 trade associations that we have in the United States are, I am persuaded, one of the chief reasons for the amazing stability of our economic organization, one of the reasons for the notable commercial relations that we have established throughout the globe. That very gregariousness which is the butt of so much sarcasm is one of the reasons why we recovered from the war-engendered depression in 1921 and 1922, and I am sure that if other parts of the world had been blessed with more organization instinct they would have made a much more rapid recovery than they did. So here, and particularly in this department and this bureau, we could not get anywhere unless we were able to deal with organized industries, who communicate their problems and enthusiasm, which in turn is translated into action during the deliberations, resolutions, and ideas that develop through meetings such as these.

Your conference, furthermore, typifies to a peculiar degree the further advancement that is aptly illustrated by the collaboration between the States and the Federal Government. Government in all things should set the best example and stand for the best effort for collaboration within its various units, whether they be national or local, in one form or another. Of course, weights and measures are the rules of the game. Simple uniformity in those rules will, however, not get us far. We are very apt to pat ourselves on the back because of the solid area of the American Republic. Our European friends do not disguise their admiration for the "uniformity of action" of this great country, the way we can plunge into any great cause and all line up together. The recent attempt to perfect the United States of Europe is about as frank a piece of flattery as you can imagine, considering the economic, political, and racial differences between the various countries. Conditions there are entirely different from the situation in this country, where, in fact, barriers do not exist so far as economic and commercial matters are concerned. But any study of industry and trade in this country brings out the truth that we are not as homogeneous as we would like to be, and your very problems here (trying to make more uniform the weights and measures procedure throughout the country) admirably illustrate that very point.

Just last week we had a conference on street and highway safety, and once again the idea of making more uniform the regulation and practices in reference to traffic were considered. One apt illustration of the need for such uniform regulations is the fact that if one were to drive to New York, a distance of 250 miles, and observed the Washington regulations, he would be jailed probably 285 times on the way, or else he would get those unpleasant red tickets by which we are assessed according to the laws of the realm.

We are homogeneous up to a certain point, but by no means completely so. We can match in this continent of ours conditions in almost all parts of the world, except, of course, the extremes of the

Digitized by Google

Tropics and the polar regions. When an American manufacturer wants to sell tractors in Australia he knows what conditions will be met in that country, which is quite similar to Arizona and New Mexico, where his tractors have been sold and used. In the Argentine again the manufacturer is on old and familiar ground because the pampas are like western prairies; and, with respect to almost any foreign markets, he can be guided by comparable conditions within the United States.

Will Hays once told me why the movies are so successful. About 25 per cent of the revenue of the industry comes from foreign royalties and foreign trade. And we enjoy certain distinctive advantages in catering to world audiences. When you put on a mob scene in Los Angeles you go out and get whatever type of mob you need. If you need Irish, they are there; and if you desire a Spanish crowd, you have it. But let any German manufacturer go out on the streets of Berlin and try to get an Irish mob; he will probably fail in the attempt. And the same is true of an English competitor who wants to put on a Spanish scene—he will have a hard time of it. So this lack of complete homogeneousness has its advantages.

There are differences in rules and regulations and standards of industry in different parts of the country. We do speak the same language, more or less, but the more I listen to my loud speaker the more I wonder how we are understood. We are not as homogeneous as we might be, and that condition lends itself to the effort you are making here to bring about something like uniformity in this very important field.

A rubber yardstick is, of course, a direct incentive to fraud. That is obvious; but I often wonder how far-reaching is the effect of such iniquitous practices. The rubber yardstick, for example, also has a malevolent influence in that it slows down industry, in that it makes caution necessary and retards business; and such an effect is especially injurious in this day of swift reactions in trade, of an ever-accelerating development in industry and commerce everywhere, which has been, perhaps, the outstanding economic development since the war.

The Bureau of Standards collaborated in the work of a committee engaged in the preparation of a report entitled "Recent Economic Changes"; and the salient finding of that committee is that business is not so different in so far as institutions are concerned—that is, the installment plan is an old thing—people have been buying and selling harvesting machines for generations—chain stores were in operation 70 years ago—and there is hardly a thing in business and commercial practices that is new—the big thing is the fearful acceleration of operation, acceleration of delivery through the laying out of bus lines everywhere, through the improvement of highways, and the amazing multiplication of automobiles. The airplane has also helped to speed up business. All this speeding up of business is an inevitable factor in our whole life. Anything which tends to slow it up is contrary to the public interest, and inadequate weights and measures are a formidable factor of that sort.

Five years ago Mr. Hoover spoke to you, and some of you may recall an illustration he used. He said that there were about a dozen types of 1-inch board. Well, 1-inch ought to be an inch everywhere

Digitized by Google

and under all conditions, but until recently there were different types of inch used in board measure, whether it was an inch in a plank planed on one side, or on both sides, or in other different kinds of board. This meant more checking, slowed down business, and brought about other difficulties.

We are priding ourselves on mass production, on the amazing volume of our industrial output, and, of course, along with that will go mass distribution. We could not get anywhere at all with our schemes of volume production unless we could also sell in large quantities; and that means, of course, quickness of turnover, which must be accompanied by uniformity of weights and measures and the prevalence of dependable standards. There is a great necessity for uniformity of sizes of containers in the units that are now prevalent. If doubt is raised in the minds of the housewife or the trade in general, there is bound to be a slowing down of business which may be disastrous.

To an increasing degree, business these days is a matter of credit. We no longer sit down and haggle with people and swap in the David Harum manner. Those days of horse trading are gone. Debts are paid to-day by little slips of paper—drafts or checks.

Credit is only another name for confidence, and you can not have confidence if there is the slightest question about the first essentials involved, namely, the weights and measures of commodities concerned. In the old days, in horse trading, you could examine the horses, look at their teeth, and make sure what you were getting; but with credit and confidence playing so large a part we must take a great deal on faith and that means, of course, as the first essential of marketing, knowing what the units of measurement are in every case.

Take the last "late unpleasantness" in the stock market. That was due mainly to a failure on the part of the speculators, both amateur and professional, to measure carefully and accurately the relationship between the earnings of the corporations and the quotations of their stock on the exchange. It was a simple problem in measurement. In that case it was necessary to have a definitely fixed yardstick to gage such operations. A number of statisticians were informed, but the average amateur in the field of speculation did not realize the necessity of being guided by such tabulated schedules and reports. Consequently, when the crash came those amateurs were totally unprepared to meet it, and as I have said, it occurred primarily because of a failure to observe the ratio of earnings to the quotations.

The inability or the incapacity to judge those realities in business, to apply carefully such yardsticks, is certain to lead to disaster. We can not go on in a state of perpetual opulence.

There is, of course, the inevitable danger of expecting too much from the apparatus or processes which you gentlemen set up in your deliberations. They form simply a means to an end. And they must be properly and sensibly used. We can not expect that, after you have decided upon uniform measures, the job is done. Those are simply vehicles toward an ultimate purpose. We can not expect, with the highly complicated economic requirements of the present day, to reach salvation through devices of that type. They are indubitably

Digitized by Google

important, but they do not accomplish everything. They are not capable of such summary, symmetrical application as the ancient Egyptian Nileometer. The Egyptian authorities would go down and look at the Nileometer and observe the height of the water, and from the height of the water they would calculate the assessment of taxes for the year, because the height of the water had a direct relationship to the flooding of the land, to farming and grazing, and, therefore, to all assessable properties. It was all very simple to them. But Mr. Mellon has a more complicated job these days.

One of our very alert statisticians down in the Department of Commerce calculated that the rate of exchange of the Colombian peso was influenced by the height of the Magdalena River. He found there was a maximum of three months' time during which the Colombians could bring coffee out. On that basis one could calculate with reasonable accuracy. The same is true of a great river in the region of Saigon in Indo-China. The height of the level of the river has a direct bearing on the size of the crop and consequently on the purchasing power of the people in that area. But in an economic order such as ours it would be rather dangerous to presume to set up such a yardstick on which you could calculate any considerable portion of our general business.

Many statisticians and others have given us prophecies and hope as to the future trend of business. In an unkind moment one enterprising young statistician went over the prophecies made by these propheteers and discovered that they were right just about 50 per cent of the time. That occurred some two or three years ago, and it is hoped that they may have improved.

There are any number of problems before us, and I do not want to enumerate many of them. But unless we do keep close contact with them, we will have the same trouble again and we will have our recovery materially retarded. We must not expect an instantaneous increase in prosperity once more. We must not expect that, simply because some very interesting and helpful conferences were held in Washington, everything will become lovely at once. It will take a considerable length of time to come out of the effect of this last depression, and it will involve divergent factors. Take this matter of construction: Because there have been a very large number of contracts let this year, it does not mean that June and July will be immediately prosperous. The results of such contracts are not instantaneous, not immediately evident, as it takes some 6 to 10 months to put contracts for construction into effect, and the effects are felt months later by the rank and file of industry in general. The "lag" is just about that. In fact, the president of a large radiator company, in one of our conferences here, brought out the fact that usually the construction business ran just about 8 or 10 months ahead of the usual normal level of the rest of the business world. In other words the building trades were having hard times and getting into trouble as far back as November and December, 1928, and consequently when the crash came along in October and November of 1929, informed persons were not at all surprised. Even now, with the sagging money rate and the consequent picking up in construction, it will take 8 to 10 months before we find the full effect of that program which was launched in January. Consequently,

Digitized by Google

there are a great many who seem to feel that it will be pretty near fall before we see any material improvement in business.

In the department's relation to industry and commerce, our business is not to prophesy, but simply to report what has happened; and we are not trying to hand out any panacea as to how betterment may be brought about. Industry is learning a salutary lesson as a result of its recent experiences. We must meet competition, which is keen, not only in foreign markets but in the domestic field as well. That brings out the element of changes in procedure and practices in the larger industries, due to the introduction of synthetics. One of the most potent factors in industry is the quiet chemist who, sitting in the midst of his smelly test tubes, suddenly develops something which will upset great industries overnight. A very powerful impetus has been given to chemistry through the war and postwar research, so that any manufacturer is foolhardy if he is more than 24 hours away from good sound chemical advice. Any business man who is sitting smugly, feeling that his business is secure, and that his competitors can not make any "silk purse out of a sow's ear," is very foolish indeed. A great chemical engineer not long ago took that axiom literally and actually made a purse out of a sow's ear. He took some ears from the porkers and developed them into a viscous solution, and the final outcome was something that looked like a silk purse. It was a process such as is used in manufacturing cellulose products.

The business world is utterly different from its former aspect, and is constantly changing; and it is of the utmost importance that we observe these changes and appraise their practical application. Take the example of style changes. It was perfectly safe for manufacturers in the old days to sit down and reel out millions of yards of goods because the yardage was pretty much the same, year in and year out, and decade in and out. But since the war no one knows what the style will be, and it would be a foolhardy manufacturer who assumed that the conditions would remain in status quo.

We had at the department one especially striking illustration of style changes and of the supreme importance of watching the consumers. About four years ago certain textile manufacturers in New England were in distress, and we asked where their market was. They did not know. They had handed their goods over to certain distributors and then forgotten about them. They now realized that it was important for them to know the ultimate consumer's buying power. We traced the merchandise movements and found that their market was out in the northern part of China. The buying power of the people had collapsed, simply because the leading industry, which was the manufacture of hair nets out of human hair, had collapsed. It so happened that a lady named Irene Castle bobbed her hair; thereupon 14,000,000 women did the same, and the hair-net business went "up the spout."

Now, is it too much to ask a manufacturer to keep watching his market and note all changes that may take place in it? Ask the first shoe manufacturers you see regarding their business outlook. They will probably tell you that the situation leaves much to be desired. Some of them failed to capitalize their opportunity and are apparently not keeping up with progress. Just the other day the largest

Digitized by Google

competitor in Czechoslovakia gave a good illustration of how industrialists are "on the job" in that country. He has representatives in the United States making photographs and designs, which are in turn flashed across the ocean in radiophotographs, so that he gets them immediately and can guarantee delivery in 10 days in this era of rapid transportation. That manufacturer has become imbued with the idea of being unfailingly vigilant and brisk—keeping up with Father Time. Father Time is no longer an old, doddering gentleman with a white beard, wrapped up in a white robe. He is a fast-stepping competitor who has shaved his whiskers because they interfere with the streamline effect; and unless the American manufacturer can show comparable speed, he will soon be left by the roadside. The changes now taking place are vital; any business men who are not alert will be left flat-footed.

These changes are going on everywhere, and that fact further stresses the importance of this Bureau of Standards. Those things that are immutable, the weights and measures and yardsticks and categories and schedules upon which this conference is deliberating are factors that should provide at least some foundation for reasonable security and permanence; otherwise, despite all the speed in trade and industry, we will get exactly nowhere.

Let me repeat that we in the Department of Commerce are glad to see you here and know that your activities will be of the greatest benefit to commerce and industry and the people of the country in general.

FIXING OF EFFECTIVE DATE OF SPECIFICATIONS AND TOLERANCES FOR GREASE-MEASURING DEVICES

Mr. FOLEY. Mr. President, yesterday while we were gathered in this conference, we had quite a discussion as to whether or not the conference would allow an extension of the time at which the specifications and tolerances for grease-measuring devices are to be put into force and effect—a postponement of one year was asked for. We showed these different men where they could get off and that we were serious about this proposition; it seems to be the unanimous opinion with all of those to whom I talked that we had won a victory, but a rather empty one. After all is said and done we hold the whip, we are in the driver's seat, we have the upper hand. These men have not made as much of an effort to comply as we thought they should. I am with our brother from Richmond, Va., Mr. Ragland, and was with him from the start. However, we discussed this thing last night and thought maybe we were a little too severe. In the past 60 days there has been a great movement to get together to solve their problems. We have also solved ours by making rules and regulations that they must live up to. So I talked to as many weights and measures men as possible—I am sorry I could not get to all—and I said, "Boys, let us be magnanimous." Now I am going to ask you, Mr. President, to deviate from the program for a few moments while I make a motion and I am going to ask Mr. Ragland to second it. The motion is this:

I move you, sir, that this conference allow the equipment men six months from July 1, 1930, to make the necessary experiments in their equipment and to bring about the necessary changes to make it comply

Digitized by Google

with specifications and tolerances, and to give the oil industry the opportunity to meet the conditions that prevail, and that at the end of that period we may confer at the call of the Chair to determine whether or not a further extension of six months is needed.

With your permission, Mr. Chairman, I will ask Mr. Ragland, of Virginia, to second my motion.

Mr. RAGLAND. Mr. Chairman and gentlemen, as a matter of personal privilege I want to thank you for your attitude of yesterday. I appreciate very much the unpleasantness of the occasion and must say that of the many years that I have come up here, yesterday you were more considerate than ever.

As far as my friend, Harry Foley, is concerned, and as far as the city of Richmond is concerned, we will still enforce the code, but I am perfectly willing to second the motion of Mr. Foley. Next year I will come up here, and I want you to say he was still magnanimous.

Mr. GRIFFITH. Mr. Chairman, I took the trouble yesterday to read over the deliberations on this subject as recorded in the proceedings of the conference of 1929. In the report on the code of specifications and tolerances for grease-measuring devices there is a discussion of policy involved in the date of adoption and enforcement. It is a policy that has been established by our very capable secretary and, as I recall it, briefly, that policy involves a tentative adoption, a period of 1 year before final adoption and a period of some 13 months after final adoption before the code is to be put into force and effect. In the discussion that arose at that time it was decided that that should be ample time for the manufacturing industry, the oil industry, and the weights and measures officials to accommodate themselves to the changes necessitated by the code.

Now, with this motion to extend this time six months additional, with the possibility of it being extended six months more, we are creating a precedent to which I can see no limit. Of course, if it is not possible for the industries to procure the equipment, then it would not be possible for the weights and measures officials to force compliance with the code; we naturally have got to take into consideration facts as they exist. But, as I was informed yesterday, there are machines—not one, but many—which do comply with the regulations and specifications, and if that is the case we should not deviate from the definite policy of this body.

Mr. HOLBROOK. Mr. Chairman, I may say for myself, personally—and I think I can also speak for the committee in this relation—that this is a very exceptional case, and no objection will be raised to the proposal for an extension in the matter. If any member of the committee disagrees I would like to have him say so now.

Mr. RAGLAND. Mr. President, my good friend Captain Griffith and I believe in giving and taking. I am the man who agitated all this trouble. I am enforcing the code and Harry Foley is enforcing it. I am enforcing it and I will make it even tighter in Richmond, but I think courtesy compels this motion.

The CHAIRMAN. You have heard the motion made by Mr. Foley and seconded by Mr. Ragland. Are there any remarks?

(The question was taken, and the motion was agreed to.)

Digitized by Google

DISCUSSION OF PAPER ON STANDARD CONTAINER ACT OF 1928

The CHAIRMAN. You remember we postponed discussion on the very important standard container act. I think Mr. Spilman is still here. Have any of you any questions you would like to ask Mr. Spilman.

Mr. FOLEY. Mr. Chairman, we are very vitally interested in one phase of the paper presented by Mr. Spilman. New Jersey was practically the first State to adopt the sales-by-weight law. Last year we had considerable discussion regarding the paper presented at that time and it seemed that New Jersey was rather out of luck in its enforcement of its law. As I understand the situation, the paper this morning dealt practically with the manufacture of these containers. Toward the conclusion of his talk, Mr. Spilman brought up the matter of sales by weight as being one of the problems which the Bureau of Standards and the Bureau of Agricultural Economics was confronted with and was trying to solve.

Now, our act provides for sales by weight. We have no legal weight per bushel in the State. All dry measures were legislated out of business for use as measures. We have an act of our own regarding the standardization of baskets which is separate entirely from the sales-by-weight law. Now, in the discussion last year as I recall it, if a farmer packed a standard bushel hamper he could use that as a measure. We allow an original container to be used to determine the amount to be delivered therein in the case of certain commodities, but we have legislated out all dry measures, used as measures. Now, are we still in the same position as we were last year? We have not had any difficulty as yet, but some of the wise ones, as you stated during your talk this morning, are using containers as measures. However, our State commission has ruled that the standardization of the container does not make it a measure but a package.

I would like to get clearly before the conference, that in those States where a genuine sales-by-weight law exists, we do not want to take exception to the Bureau of Markets, but I think we will go along as we are until they hale us into court and get a decision.

Mr. SPILMAN. I only wish you more power in getting across the sales-by-weight proposition.

A MEMBER. Mr. Chairman, may I ask Mr. Spilman whether or not this standard container act does make a container officially a legal measure?

Mr. SPILMAN. In an interpretation of the law the Solicitor of the Department of Agriculture held that it did.

APPOINTMENT OF COMMITTEES

The CHAIRMAN. With the consent of this conference, the Chair at this point will appoint the following committees:

As the committee on resolutions: A. B. Smith, of Pennsylvania, chairman; J. H. Foley, of New Jersey; P. D. Dukesherer, of Michigan; S. H. Wilson, of Georgia; Thomas Flaherty, of San Francisco, Calif.; James A. Sweeney, of Boston, Mass.; and S. T. Griffith, of Baltimore, Md.

24342°—31——6

Digitized by Google

As the committee on nominations: Francis Meredith, of Massachusetts, chairman; I. L. Miller, of Indiana; George Warner, of Wisconsin; B. W. Ragland, of Richmond, Va.; and W. A. Payne, of Monroe County, N. Y.

There is also a vacancy on the committee on uniformity in weights and measures requirements, to which I will appoint V. A. Stovall, of Texas.

THE SALE OF CHEMICALLY TREATED COAL

By I. L. Miller, *Commissioner of Weights and Measures, State of Indiana*

Mr. Chairman, ladies and gentlemen, invitation to present this paper was received rather late and I rather hastily accepted it, having in mind that about a year ago chemically treated coal first came to our attention and at that time I made somewhat of an investigation and found information rather easy to obtain. I thought it would take only two or three hours to run down town and get some data and then write up what I had found. Very much to my astonishment, among the dealers serving about 400,000 people I found only one dealer who was actually chemically treating coal. I do not mean he was the only one selling chemically treated coal, but he was the only one applying the chemical in his establishment. The others were handling coal treated at the mines. I had no opportunity to find out about the treatment of coal at the mines.

Chemical treatment of coal for domestic use for the purpose of allaying dust is comparatively a new development. The treatment adds nothing to the fuel value of the coal, but is intended solely to eliminate the dust nuisance both while delivering and in handling while firing. Dealers, who have sold treated coal and those persons who have purchased and used it, are apparently unanimous in their opinion that the treatment effectually serves the purpose intended.

Dealers and weights and measures officials in whose jurisdictions chemically-treated coal has been sold have been much concerned regarding the proper method of its sale. Some officials have insisted that the dealer should make allowance in weight for the added moisture from the treatment. Dealers who have sold the treated coal insist that it is a distinctive article and should not be so penalized. On the other hand, some dealers in untreated coal insist that they should have the privilege of adding moisture, in the form of water, if no deduction of weight is to be made for moisture in treated coal. The question of weight deduction in the case of treated coal was referred to the Indiana State Department of Weights and Measures early in 1929. At that time the department indicated its attitude in a reply to an inquiry from a coal company applying the treatment, as follows:

> In view of the fact that in the process of the chemical treating of coal the weight of added water and chemicals varies rather widely but, perhaps, in no case is extremely large, and in view of other questions that have arisen as to the effect of the chemicals upon furnaces and stoves, the department has decided that the sale of chemically-treated coal under names that will indicate clearly that the coal has been treated, is of more importance to the purchaser than a small deduction for added weight. We are, therefore, of the opinion that all treated coals should be advertised and sold under names that will plainly indicate their nature. Such coals are not "dustless" and should not be sold as such, since all the dust is still present but in a form that does not cause inconvenience in handling.

Digitized by Google

Chemically-treated coals have been sold almost universally as "dustless." The dictionary defines "dust" as, "fine, dry, particles of earth or other matter so comminuted that they may be raised and wafted by the wind; that which is crumbled to minute portions; fine powder." According to the first meaning given, the advertisements have been correct, since the finely divided particles are no longer wafted by the wind. It is doubtful, however, if this is the complete thought conveyed to the purchaser of coal who reads the advertisement for "dustless" coal. It is just as reasonable to assume that the purchaser accepts the two last meanings mentioned in the definition—that dust consists of finely divided particles, or is a powder—and assumes that "dustless coal" means that the fine particles or powder have been removed. Because of the possibility of misunderstanding arising regarding the meaning of the term "dustless coal," its use is inadvisable.

The chemicals used in the treatment of coal are deliquescent; that is, they have the ability of absorbing water from the atmosphere or other sources. Calcium chloride forms the basis of all the compounds which have come to the attention of the weights and measures department. One local dealer stated that he used a saturated solution prepared from the crystalline calcium chloride. A company supplying the treatment states that their compound is composed of three elements, all of which are dust layers. Another proprietary compound is claimed to consist of calcium chloride treated in such manner that the solution made from it has increased viscosity, increased capillary or "wetting" action and is so neutralized that it does not injure the metal of furnaces and equipment. Magnesium salts have been used in combination with calcium chloride. The United States Dispensatory describes calcium chloride as "odorless, having a sharp saline taste and very deliquescent." According to the same authority 10 parts by weight of calcium chloride dissolves in 12 parts of water at ordinary room temperature. It will be recognized that calcium chloride is the dust allaying agent used by some State highway departments for the treatment of earth, gravel, or stone roads.

The benefits claimed for the calcium chloride treatment are, first, no dust. Coal wet down with water dries out, but coal treated chemically remains free from flying dust for at least one year. Second, reduced smoke. The treated coal has a tendency to burn cleaner and better. Third, reduced slack. Chemical treatment tends to seal, to a certain extent, moisture in the pores of the coal, thus reducing slacking.

One of two types of apparatus is generally employed in applying the chemical to the coal. The simpler type consists of an elevated tank in which the solution is prepared, and an attached hose equipped with a spray nozzle through which the solution is applied to the coal. The more efficient type includes a tank, pump, and electric motor, together with the necessary high-pressure hose and spray nozzles. In this type the tank is equipped with a special agitator which mixes the water and chemicals. The solution is then pumped through a hose with spray nozzles under a pressure ranging up to 300 pounds.

Three methods of treating coal are in general use. In the first method and the one which is perhaps the least used, the solution is sprayed upon the coal after loading into the truck. It is evident that this method is also least efficient, since the chemical is not evenly

Digitized by Google

distributed throughout the load. In the second method of application the spray nozzles, two or more in number, are attached at the top of the elevator used in conveying the coal from the car into the dealer's bin. This method is very efficient, since all the coal receives an even spray of the chemical. In the third method the chemical is applied at the mine in the same manner as just described in method two. Treatment at the mine seems to be most popular with the retail dealer since the larger portion of treated coal sold is mine treated.

The cost of treatment varies somewhat widely according to available data. One company marketing the prepared saturated chemical solution which requires dilution with 11 parts of water, claims that coal in lots of 500 tons can be treated by the dealer at a cost of 6 cents per ton. Another large manufacturer states that the cost is about 25 cents per ton in the case of low volatile coals and from 15 to 20 cents per ton in the case of the harder coals. The only local dealer consulted states that the cost ranges up to 25 cents per ton. This dealer says that while previously his company had charged the purchaser 25 cents per ton extra for treatment, for the past year no difference in prices had been made between treated and untreated coals. Similar reports have been received from other dealers.

The weights and measures official is particularly interested in the effect of chemical treatment upon the weight of coal. Manufacturers and distributors of chemicals and chemical compounds for coal treatment have stated that the weight of added water and chemicals does not exceed 40 pounds per ton. The average is perhaps around 30 or 35 pounds per ton. In the case of one load of coal in which the process was observed, the added water and chemicals amounted to 35 pounds per ton. It is believed that these figures are very nearly correct.

Abuse of the practice of chemical treatment of coal is suggested by one large distributor of the treatment compound. After mentioning the treating of slack, this manufacturer states that "many dealers sell this dustless slack as such, while others find that a few shovelsfull to the ton of regular coal is satisfactory, and they get rid of it that way." This amounts, of course, to adulteration, since a very cheap product is added in small amounts to one that sells at a much greater price.

All manufacturers of chemical compounds and apparatus for their application claim that the chemicals recommended by them do not injure the metal parts of furnaces and stoves. No authentic data have been available either to substantiate or refute these claims. Some analyses of treated coals have been made which show that the chemicals added are not sufficient in amount to materially affect the percentage of ash. Some experiments which have been reported indicate that the combustion of the coal is little affected by the treatment.

The chemical treatment of coal has become well established. There is every reason to believe that the sale of treated coal will continue to increase. The pertinent question then is, "What attitude shall the weights and measures official take toward the sale of chemically treated coal?" At least two associations of weights and measures officials have already gone on record in answer to this question. The Sixteenth Annual Conference of Weights and Measure Officials of the State of Michigan, in Detroit, June 25 to 29, 1929, passed a resolution to the effect that—

Digitized by Google

it is its opinion that the so-called calcium chloride method of treating coal to make it dustless is not objectionable from a weights and measures standpoint, when by this process the weight of the coal is not increased by more than 30 pounds per ton, and when, in addition, the coal so treated is described on the delivery ticket and billed to the consumer as "chemically treated" coal.

At its conference in Indianapolis in June, 1929, the Indiana Association of Weights and Measures Officials adopted the following resolution:

Resolved, That the term "chemically treated" be hereafter applied to coal that has been treated in order to allay the dust usually attendant in the delivery of coal; further, that since in the chemical treatment there is of necessity a certain amount of moisture added, that it be the consensus of opinion of the weights and measures inspectors assembled that 2,000 pounds shall constitute a ton, just the same as though no treatment had been added, providing that advertising and quotations shall specify "chemically treated" coal.

The attitude indicated in these resolutions seems fair and reasonable. Several factors which can not be controlled make deductions of weight for added moisture impracticable. Coal treated at the mine normally contains less moisture than coal treated in the yard. The average difference has been estimated at about 10 pounds per ton. Generally more moisture will be present in coal treated after loading into the delivery truck than when treated at the time of unloading into the yard bin. The percentage of moisture will also vary with the varieties of coal treated, as well as with the size of the coal lumps or particles. Precedent is not lacking for the sale of treated coal as such without taking into account the moisture content. In many lines of food manufacture natural products are slightly modified, but sold under the name of the product with a qualifying word or phrase.

Dealer and coal consumer are both protected if coal which has not been fraudulently manipulated is sold under terms which both understand. Interests of both dealer and coal consumer are safeguarded when chemically treated coal is sold by avoirdupois weight without deductions for moisture added through the treating process, provided, first, that the moisture added is kept within the limits necessary to properly distribute the chemical; second, that the coal is true to variety and grade; and, third, that the coal is advertised and sold as "chemically treated" coal.

THE RETAIL GROCER

By HENRY LOHMANN, *representing the National Association of Retail Grocers*

Mr. Chairman and members of this conference, on behalf of the National Association of Retail Grocers, whom I have the honor to represent, I wish to thank you, Mr. Chairman, for your kind invitation to take part in this conference. Our national association always welcomes all such invitations from any of the Government agencies and our affiliated local associations are ever willing to cooperate with their commissioners; as we believe we retail grocers should be given an opportunity to present our side on all matters affecting the grocery and food business. We are firmly convinced that the greatest amount of good will accrue from such conferences between the Federal, State, and local agencies, and all trade bodies, to eliminate abuses or unfair trade practices by mutual agreements rather than by process of law.

Digitized by Google

Mr. Janssen, our national secretary, suggested to me that I speak on the relation between the weights and measures department and the grocers. This is indeed a very delicate subject, but as a national association we are continually cautioning our local associations to meet with their weights and measures commissioners, invite them to their meetings and have round-table discussions on how best to serve the consuming public so that when they make their purchases they are assured of getting 16 ounces to the pound, or the correct measure when commodities are sold by the quart, peck, or bushel.

Our association does not tolerate any member who is not square with his customers in giving them honest weight or measure, or who employs other unfair or questionable methods in his business. We firmly believe that any grocer who uses such methods usually does not last long in business, as the modern housewife has scales in her kitchen and she will soon discontinue dealing with any merchant whom she detects giving her short weight or measure. As secretary of the Brooklyn Retail Grocers' Association, I do not recall ever hearing of any of our 750 members being in trouble with our local bureau of weights and measures in my 30 years' membership, because we will not tolerate any such practices.

At present we hear a great deal of propaganda about short weighting the public. Much of it is from promotors, and I do not think you will find any reputable grocers, large or small, who will stoop to such practices. I am assured if the weights and measures officials will enforce the law and make rigid inspections in every city and State and prosecute any merchant who willfully gives short weight or measure to the public, we will in a short time rid the country of this practice. Our national, State, and local associations will cooperate in every manner to bring this about.

The next subject I wish to speak about is the irregular or diversified packing of farm products. There is a large amount of unnecessary waste in packing and handling these products that could and should be eliminated. Retail grocers feel that you men should give this matter serious thought and strict study. As you know, at the present date fresh fruits and vegetables can be bought all the year round, being shipped from every State in the Union and packed in all kinds of containers.

The modern method of selling vegetables and fruit is either by the pound or by numerical count, which you will agree with me is the most simplified, accurate, and economical way of handling them. Then why not have the farmers, commission men, and wholesalers do the same to the grocers or retail fruit men? Knowing that selling fresh fruit and vegetables by weight or numerical count is the most efficient and accurate way, we feel that we should be permitted to buy these products in the same way. At present in the markets we buy some articles by weight, others by measure, and still others by container, and must guess at the weight. This makes it necessary for each retailer to weigh each container when it arrives at his store in order to find out how many pounds he bought. This causes confusion, as very often he has not sufficient time and must guess at the amount of contents.

We feel a good many articles could easily be packed in containers by the producers and sold by weight, such as potatoes, onions, turnips, carrots, etc. These articles adapt themselves very readily

Digitized by Google

to shipping in sacks, preferably in 100-pound units. Beans, peas, etc., could be packed in bushel hampers with the weight of contents marked on hamper, and for the small grocer or fruit dealer in smaller units of 10 and 20 pounds. Bunched vegetables, such as carrots, beets, radishes, etc., should be sold by numerical count and packed in crates or boxes in lots of 25, 50, or 100. Lettuce of all kinds should be sold by numerical count and should be packed in crates or boxes. The New York State standard crate for lettuce is to be recommended as the ideal crate for shipping lettuce. Lettuce shipped from Southern States, such as Florida, Louisiana, and Texas, is usually sent in baskets, and comes to us in the New York market in 48-quart baskets. This means nothing to the retail dealer, as he sells them by the head; consequently, he has to count the heads in each basket in order to arrive at the cost per head. If we look at the economical side of the question, let me say this is a very poor way of shipping lettuce, as the percentage of broken and decayed heads is very large and the receivers and grocers will not accept them, which brings heavy losses to the doors of the farmers and shippers. In the New York standard lettuce crate this is almost entirely eliminated.

After studying the 1928 container act, you will find that this act only applies to certain types of baskets; it does not apply to other containers, such as barrels, bags, etc., and even permits the use of other baskets if made in a different way than the baskets mentioned in this law, or if made from other material. It also makes it optional for maker, producer, or shipper to mark net contents on container, which should be mandatory.

Another instance is the California law, which permits other than the standardized apple box, and other sizes of grape lugs, besides the standardized size, if conspicuously marked "Irregular." This act does not make allowance for natural shrinkage; it should do so, and the shrinkage can be worked out by actual test in a very simple manner. I will try and point out to you how I think this can be arrived at. As soon as a container is packed with any of these farm products mark on the container the hour and the day the packing took place, then submit the full container to the most severe shipping test for a given period of time. Then measure or weigh the contents at the expiration of this period, and you will be enabled to find the amount of shrinkage per hour or day. These tests can be made for 24, 48, or 72 hours or more, according to the distance of shipment.

As an example, if products should be sold by weight, how simply and easily the allowance for shrinkage could be brought about, and the matter of adjustment of loss by spoilage be computed. Take, for instance, a basket of string beans: Net weight at time of packing, 35 pounds; allowance for shrinkage in 48 hours, 3 pounds; weight at time of arrival, 32 pounds.

The grocers feel the allowance should be made at the point of shipment, where the cost is lowest. To insure proper identification the name of the shipper and his address should be stamped on the container. This will facilitate the identification of the shipper, and the Federal bureau, if it found out that this shipper was in the habit of packing slack or not marking his weights properly, could take action against him. The effect of this action would be noticeable in all shipments.

Digitized by Google

I found out yesterday that we had no effective weights and measures laws in a great many places. I really think that every State should have a weights and measures law, and our association would be very glad to take it up with you and try to get a weights and measures law wherever one is needed. We believe this work should be pushed, and we will get behind it. I guarantee the consumer will help put the law over in a very short time.

I am now going to come down and talk on a very delicate subject, and that is the sale of bread in standard-weight loaves. This is required in Indiana and other States. It is a grave injustice, not only to the baker, but to the consuming public, including the housewife, and I will try to demonstrate why this is so. In these States the weight of the bread is required to be 1 pound, 1½ pounds, or multiples of a pound. The price of bread is governed by the cost of flour and other ingredients used and the labor, and the baker and retailer should have a profit. In each community there is usually a certain set price for bread. When the bakers pay a certain price for the flour the consumer must meet that cost. If the cost of the flour rises, the baker can keep the local price of the bread constant but make the loaves slightly smaller. If he did not do that he, perhaps, would have to raise the price of bread to an odd cent. This rise in price will affect the retail grocer. Now, in New York City the standard price of bread has been 12 cents for three or four years, but we have no mandatory weight law. The loaf may weigh 20 ounces at one time, 22 ounces at another. We have no trouble with that. However, if it were made mandatory to bake a loaf of a certain weight, and flour went up, the baker's price would go up and the retailer would have to raise his price, and you would have confusion. If on the contrary the baker did not raise the price he could not put the same quality of ingredients into the loaf. In the absence of a mandatory standard-weight loaf the baker could make the weight accordingly and give the consumer the right amount.

Our National Association of Retail Grocers and its affiliated local and State associations will be pleased to hear from you men in conference here how we can cooperate with you to bring about more adequate provisions for the right kind of service, and a more rigid inspection, because we feel that most cities are woefully lacking in adequate weights and measures inspection. Gentlemen, I thank you.

DISCUSSION OF ABOVE PAPER

Mr. ROGERS. Mr. Lohmann, I would like to ask a question. You ask cooperation. Cooperation is a fine thing for the weights and measures men. But can this be a one-sided proposition? We have no record in the State of New Jersey where we were asked to attend a convention or meeting of either the retail or the wholesale grocers; and yet we always invite those groups when we hold our meetings.

Mr. LOHMANN. I tell you what I will do. I will get in touch with your local secretary, and I think you will be invited to the next State meeting.

Mr. ROGERS. I think if you will make that a general practice and get in touch with the sealers generally you will find those men will be glad to attend your meetings.

(At this point, at 1 o'clock p. m., the conference took a recess until 2 o'clock p. m.)

Digitized by Google

FOURTH SESSION (AFTERNOON OF WEDNESDAY, JUNE 4, 1930)

TOUR OF THE LABORATORIES OF THE BUREAU OF STANDARDS

(The afternoon session of the conference consisted of a visit to the various laboratories of the Bureau of Standards, particular attention being devoted to the division of weights and measures. In order to make the trip of maximum interest and helpfulness, the delegates and guests of the conference were divided into small groups, each group being in charge of a member of the staff of the bureau.)

Digitized by Google

FIFTH SESSION (MORNING OF THURSDAY, JUNE 5, 1930)

The conference reassembled at 10.07 o'clock a. m. at the Bureau of Standards, Francis Meredith, first vice president, in the chair.

THE INSPECTION OF WEIGHTS AND MEASURES IN PHARMACIES

By GEORGE F. AUSTIN, Jr., *Assistant Supervisor, Bureau of Weights and Measures, Detroit, Mich.*

Mr. Chairman and members of the conference and guests, the subject upon which I am going to talk, as you can see by the program, has to do with the inspection of prescription scales and glass graduates. Perhaps a better title to the paper would be "Life in the Balance." It would give it a more serious complex, which I think would bring about better results.

The life of a weights and measures official could well be compared to a huge nightmare, wherein the entire stage is occupied with weighing and measuring devices ranging from those capable of weighing and measuring a beam of light to those capable of weighing and measuring the world itself.

As tasks go, the work of a weights and measures official is a mighty one, and with its many phases, each one important in itself, we find it very difficult at times to decide just what phase of the work has to suffer most through our inattention. As a result, it is alarming to note that the supervision of prescription balances and glass graduates used in pharmacies for compounding prescriptions, in many instances containing deadly drugs, is that phase of our work which is generally the most neglected. Just why this part of our work is so commonly neglected may be explained in many ways, but that there is a vital necessity for it will be pointed out in reports to follow.

When I received this program assignment, together with information to the effect that this particular subject had not been touched on for a long time, I became curious to know just how many years ago it had been given mention and what was said. So I immediately consulted the very splendidly arranged index which the Bureau of Standards just recently issued for the proceedings of each National Conference of Weights and Measures Officials. To my surprise I found that 16 years have elapsed since the subject of prescription scales and glass graduates has occupied a place on the national conference programs. In the year 1914, on the occasion of the ninth annual conference, a paper was presented by F. P. Downing, who was then chief inspector of weights and measures in Wisconsin. To say the least, Mr. Downing's paper was a masterpiece; he not only presented his entire subject in a masterly and scientific manner but he succeeded in making it comprehensive and to the point. And so in compliment to Mr. Downing and for your own personal aggran-

Digitized by Google

dizement I urge you to scan this very fine report, which is to be found in the Report of the Ninth Annual Conference, on pages 39 to 52, inclusive.

After reading Mr. Downing's paper myself I came to the conclusion that there was not very much left for anyone to say on the subject, except, perhaps, to report on the present-day conditions thereof. Simultaneously, however, I saw an urgent need for the resurrection of his paper and the injection of some inspiration and enthusiasm into many of our delegates for the purpose of stimulating their present feeble activities in this branch of our work, which is so very important to life itself.

What is life? Life in reality is a challenge to our physical strength from the time of our advent on earth until our death. A challenge to meet, endure, and overcome, if possible, the many trials and tribulations which our bodies are subjected to constantly, at times threatening our very existence. Part of that great challenge to life itself is a moral challenge to every living soul; it comes in the form of opportunities, and the one paramount opportunity which is always present, the one I choose to call your attention to, is that of safeguarding public health.

How many of us ever stop to consider what a glorious privilege it is to live, to know, to act, to listen, to behold; to walk upon the green earth; to look up at the blue summer sky; to see the sun sink slowly beyond the line of the horizon; to see the outstretched ocean; to look down yawning precipices or over distant sunny vales; to see the world spread out under one's feet like a mat? To do all this is but part of the joy of living; and so, you see, it is not difficult to realize how precious life really is, when one stops to consider what life really means.

In the city of Detroit we have been systematically testing all prescription scales, weights, and glass graduates used in the drug stores for the past seven years, and the data listed herewith will serve to impress upon you the necessity for this type of work.

Prescription scales

Year	Approved	Condemned	Confiscated
1923	537	90	3
1929	544	52	2
	7+	38−	1−

As indicated, there were 73 per cent more prescription scales in use condemned in 1923 than in 1929.

In some cases we found that it required as much as 10 grains to move the beam from a position of equilibrium.

Digitized by Google

Prescription weights

Year	Approved	Condemned and confiscated
1923	11,000	1,914
1929	12,000	315
	1,000+	1,599−

As indicated, there were 508 per cent more prescription weights in use condemned in 1923 than in 1929.

The ranges of errors found in weights condemned and confiscated in 1923 were as follows:

	Grains
5-grain weights found in error up to	1.6
10-grain weights found in error up to	3.1
20-grain weights found in error up to	3.0
30-grain weights found in error up to	6.3
40-grain weights found in error up to	7.3
60-grain weights found in error up to	8.5
120-grain weights found in error up to	13.0

Glass graduates

Year	Approved	Condemned and confiscated
1923	1,800	236
1929	2,000	78
	200+	158−

As indicated, there were 203 per cent more glass graduates in use condemned in 1923 than in 1929.

The testing equipment used for the inspection of precision weighing and measuring devices in Detroit, consists of the following:

One small pocket balance.
One set apothecary weights.
One set metric weights.
One set grain weights.
One 16-ounce cylindrical glass graduate.
One 8-ounce cylindrical glass graduate.
One 4-ounce cylindrical glass graduate.
One 2-ounce cylindrical glass graduate.
One 1-ounce cylindrical glass graduate.
One 1-dram cylindrical glass graduate.

This equipment is contained in two oak carrying cases which are very compact and easily carried.

The Michigan State department has just recently inaugurated a systematic supervision of prescription scales, weights, and glass graduates. Four men have been assigned to this work, and each one is furnished with a small leather handbag, containing the following equipment:

One small pocket balance.
One set apothecary weights.
One set metric weights.
One 4-ounce conical glass graduate.
One 1-ounce conical glass graduate.

Digitized by Google

In carrying on this great work, with its many phases and ramifications, it is quite obvious that a progressive type of personality is a valuable adjunct. In general, as everybody knows, there are three types of personalities, conservatives, average citizens, and progressives. The conservatives constantly resist change; the progressives just as naturally promote change; while the average citizens, by far the largest class, sometimes side with one group and sometimes with the other. Sometimes they are deceived by the rainbow promises of visionary radicals; sometimes they pay the penalty of listening too much to the forebodings of croaking fossils. Most times, however, they are sanely reasonable, open-minded but demanding to be "shown," so that to each extreme group they seem to be almost in league with the opposite faction. But in our line of endeavor, it is paramount that we be progressives, and as progressives we must necessarily be constituted with three great moral prerequisites, namely, restless dissatisfaction, constructive thinking, and enthusiastic determination.

Restless dissatisfaction, the first requirement, is the motive power in individual life, in national life, in commerce, in politics. Never let well enough alone. You were put here to work for yourself and for others, and especially for those to come after you. The man who is letting well enough alone and not trying to do better, might just as well be off the earth and give his place to some one who is willing to work. He does not deserve the noble work done here by the dissatisfied before he was born. We might all be traveling across country on a camel's back, like the Queen of Sheba, if we had been satisfied with camels and had not invented the 2-wheeled cart, the stage coach, the express train, the automobile, and the flying machine.

Constructive thinking, the second requirement, is the art of keeping your mind on the great and splendid things you would like to do; and then, as the days go gliding by, you will find yourself unconsciously seizing upon the opportunities for the fulfillment of your desire. To do constructive thinking, it is essential for one to be logical, rational, scientific, and philosophic.

Enthusiastic determination, the third requirement, is the fire that blazes in every successful life. It is the one necessary ingredient in the recipe for doing good work. It tramples over prejudice and opposition, spurns inaction, storms its object, and like an avalanche overwhelms and engulfs all obstacles. It is nothing more or less than faith in action.

Without restless dissatisfaction, without constructive thinking, without enthusiastic determination, man ceases to be progressive.

* * * * * * *

DISCUSSION OF ABOVE PAPER

Mr. SCHWARTZ. Mr. Chairman, I have been interested in the testing of prescription scales, weights, and glass graduates since 1915. I would like to ask Mr. Austin if he considers that a glass graduate can be accurately tested in the field and also how he works it—what fluid he uses.

Mr. AUSTIN. We use the raw water. As to accuracy, we have supervisors who go out from time to time and check over the work

Digitized by Google

of the men; in some instances they have brought graduates which have been tested in the field, into the laboratory and checked them and have found the previous calibration very accurate.

Mr. SCHWARTZ. In New Jersey our experience has been that the testing of glass graduates in the field has been very unsatisfactory; the test is not as accurate as the one we get in the laboratory. Because of the adhesion of the liquid to the glassware the test is made rather difficult—it is practically an approximation.

Mr. AUSTIN. We take care of it very nicely. We first wet the vessel we are about to test, very carefully. After water has been poured out of our test graduate it is quite easy to drain. Of course there is a minor possibility of an error of very little consequence.

But the check tests which we have made have proved conclusively that the field test is very satisfactory. I do not know why it could not be satisfactory in your State.

Mr. SCHWARTZ. Well, of course, the making of our tests is a statewide proposition. You only have a city to cover. We cover the entire State and make a specialty of that branch of the work. Some of our work is practically similar to that which you do. But we feel there is great need for accuracy in this type of work, and in the testing of graduates we are not satisfied that we get nearly as accurate a test in the field as we get in the laboratory.

Mr. SWEENEY. Mr. Chairman, may I ask Mr. Austin as to the policy they pursue in sealing weights and glass graduates in the field. Are the weights stamped or is a certificate furnished?

Mr. AUSTIN. We do not mark the weights. We feel that were we to stamp very fine weights, there would be the danger of making them inaccurate. Apparently it is not practical and so we have gone along without it.

I get your point that there is a risk that new weights might be secured or replacements made and that the certificate is only a guarantee that at the time we were there the weights were bona fide, but I do not think stamping would improve the situation at all. You might say this about scales in grocery stores. You can test and seal such scales, but 24 hours after you go there is no guarantee that the scales are accurate. The same thing would be true in scales used in drug stores. Does that cover your point?

Mr. SWEENEY. It does. But what I was going to suggest is this: In Boston we designate the small weights by 1, 2, or 3 points, using a very fine sharp instrument to stamp them. We also furnish the manager of the store with a certificate describing the weights as to shape—whether oblong or square—and also designating the marks and number of points thereon. If there is a reinspection of that place, we demand that the certificate be shown to us—of course, we have a duplicate copy of the record in the office. The sealer checks the certificate to see whether any new weights have been added. If the sealer checks the weights and finds some which do not correspond with the certificate, then he knows which weights have been added and he need test only the new weights.

Mr. AUSTIN. I like that idea very well.

The ACTING CHAIRMAN. I might interject that this is the practice throughout the State of Massachusetts.

Digitized by Google

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON SPECIFICATIONS AND TOLERANCES FOR AUTOMATIC-INDICATING SCALES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN [4]

Mr. Chairman and gentlemen, your Committee on Specifications and Tolerances has prepared a code of specifications and tolerances for automatic-indicating scales. This subject has been under consideration for several years. It was included in the program last year, but on account of insufficient time the committee found it impossible to bring in a report at last year's conference. The necessity for specifications for automatic-indicating scales, however, was pointed out at that time in the following words:

> I may say, however, that it is the thought of the committee that the conference does not have satisfactory specifications for automatic-indicating scales, or if there are satisfactory specifications they are so widely distributed throughout various codes that it requires considerable cross-referencing to determine just what the requirements are. For instance, when these codes were first established the spring scale was the most widely used automatic-indicating scale, and, therefore, the requirements as to graduations on dials, etc., were included under the heading "Spring Scales." However, with the rapid advent of automatic-indicating scales of differing types, it seems that it would be more reasonable to have the specifications referring to graduations on dials, etc., assembled under the general heading "Automatic-Indicating Scales." As you know, we already have tolerances for this class of machine.
>
> That outlines what the committee has in mind and we may advise that we may find it possible to bring in next year a report along these lines, in which case you will have an opportunity to accept or reject the recommendations made.

As you know, in Handbook M85 of the Bureau of Standards, containing the codes of specifications and tolerances of this conference, we do have under the heading of "Large Capacity Automatic-Indicating Scales," definitions and tolerances, but no specifications. It is intended that the heading here proposed supersede that one and that the specifications be general ones, referring to all scales of this class, regardless of capacity.

In general, the requirements of this proposed code which is now being placed in your hands are by no means new ones, and it seems that we may depart from our ordinary procedure followed in the adoption of new codes, and that, therefore, this new code need not be tentatively adopted. It is therefore recommended for final adoption at this time to go into force and effect on July 1, 1931. In the meantime, of course, the specifications for the various classes under their respective headings remain in full force and effect. When this code finally goes into effect it will be advisable to delete from our present codes various specifications which duplicate the material contained in this report.

Underlined portions of specifications are intended to be nonretroactive when the code goes into effect.

Finally, your committee feels that this code is by no means complete and that doubtless from time to time it may be found desirable to add specifications to this heading. Your committee during the coming year will be very pleased, indeed, to receive suggestions from anyone as to requirements which it is felt should be included and

[4] The specifications and tolerances for automatic-indicating scales, as adopted by the conference, appear in the appendix, beginning on p. 150.

Digitized by Google

will give any such suggestions very careful consideration. Your committee does feel, however, that this code constitutes a good beginning in this important field.

Respectfully submitted.

(Signed) F. S. HOLBROOK, *Chairman*,
A. W. SCHWARTZ,
CHARLES M. FULLER,
I. L. MILLER,
Committee on Specifications and Tolerances.

DISCUSSION OF ABOVE REPORT

Mr. HOLBROOK. The suggested provisions of the code recommended, and which has been placed in your hands, will now be read, as follows:

DEFINITION.—An automatic-indicating scale is a scale in which is embodied or to which is attached a self-acting mechanism, the capacity of which may be equal to or less than the total capacity of the scale, through the agency of which the indicated or recorded weights of variable loads may be obtained. This definition is not to be construed to include scales which automatically weigh out commodities in predetermined drafts, such as automatic grain hopper scales, packaging scales, etc. Automatic-indicating scales may be of any one of the following types as classified and defined in these codes of specifications and tolerances: Platform scales (including counter platform scales), counter scales, spring scales, straight-face spring scales, and computing scales. Each automatic-indicating scale shall be subject to the following specifications and to those given under the heading "Scales—General Specifications"; and, in addition, each scale falling within the definition of any of the classes mentioned above shall be subject to the specifications for such class except in so far as they may be modified by the specifications herein.

SPECIFICATIONS.—1. The weight dial or reading face, or the indicator, whichever is designed as the stationary element, shall be securely fixed in position; the moving element of the combination shall be securely attached to its operating mechanism: Provided, however, That this specification shall not be construed to prohibit the employment of a movable auxiliary dial or reading face or a movable auxiliary indicator designed to be rotated or moved in reference to a fixed dial or reading face or a fixed indicator, respectively, for the purpose of "balancing out" tare weights.

This specification is to supersede specification No. 1, under the heading "Spring Scales," reading as follows:

1. Reading faces shall be permanently fixed in position.

The specification is amplified properly to cover the moving and stationary elements of the combination. When the specification was first written only a movable pointer or indicator was considered, but now we have, as you know, a large class of scales in which the reading face or dial is the movable element and the indicator is fixed in position.

The proviso refers to scales in which there is incorporated a device for determining tare. These scales are of various kinds; usually an auxiliary indicator or an auxiliary reading face is provided for the purpose of balancing out the tare of containers which are being filled. These scales are designed to indicate at one and the same time the gross weight and the net weight of commodities placed upon the platform.

The ACTING CHAIRMAN. In view of the fact that the report of the committee is in the nature of a progress report and that the entire

Digitized by Google

subject is one that should be under observation and consideration, during and until the next conference, the Chair considers that it might conserve time if we do not adopt each specification individually but merely make observations, if there happen to be serious objections to some certain specifications. I think that after all of the specifications have been read we might consider the adoption of the report as a whole.

Mr. HOLBROOK (reading):

2. All weight graduations on the dial or reading face shall be clear and distinct and in no case shall their width be less than 0.008 inch *nor more than the width of the clear interval between the graduations. Corresponding graduations shall be equal in width. Main graduations shall not be more than 50 per cent wider than subordinate graduations.*

This specification is to supersede specification No. 2 under the heading "Spring Scales," reading as follows:

2. All graduations shall be clear and distinct and equally spaced *and in no case shall their width be less than 0.008 inch.*

The requirement for equal spaces between graduations has been eliminated, inasmuch as other scales, in addition to spring scales, are included within the purview of the provision. You will note, also, that some new material has been added.

3. There shall be a clear interval between the weight graduations on the dial or reading face and this interval shall in no case be less than 0.04 inch. This interval is to be measured between the adjacent edges of successive graduations representing the smallest subdivision on the dial or reading face, and along the line of travel of the index of the indicator and shall be maintained whether or not the graduations are "staggered" or arranged alternately; that is, when the graduations are staggered the interval shall be construed to be the space from one graduation to the next consecutive graduation extended, if necessary, to intersect the line of measurement. When the graduations are not parallel the interval shall be construed to be the widest separation of the graduations which is included within the travel of the index of the indicator.

That specification is to supersede specification No. 3 under the heading "Spring Scales," which now reads as follows:

3. *The clear interval between the graduations shall not be less than 0.04 inch.*

You will note that the basic requirement is identical with the old basic requirement, but an interpretation of the manner of measurement has been included. Especially, if staggered graduations are employed, it is provided that the clear interval shall, nevertheless, be maintained.

4. The value of the minimum graduation on the dial or reading face shall be construed to be the smallest weight value represented by the travel of the indicator from the center of any graduation to the center of the next succeeding graduation.

This specification is new material. The term "minimum graduation" has been used in the specifications, and it is felt by the committee that this term should be defined. The language suggested is considered to be a reasonable interpretation of that term.

5. An automatic-indicating scale shall have a definite and clear zero graduation and shall be susceptible of giving an indication back of the zero graduation sufficient clearly to disclose an out-of-balance condition. These conditions shall be fulfilled whether the entire dial or reading face is graduated or the graduations commence at a fixed load.

Digitized by Google

That specification is to supersede specification No. 5 under the heading "Spring Scales," reading as follows:

5. A spring scale shall have a definite and clear zero graduation and there shall be no stop to prevent the indicator from going beyond the zero graduation. These conditions shall be fulfilled whether the entire face is graduated or the graduations commence at a fixed load.

The specification has been reworded to accommodate scales having either a movable indicator and a fixed reading face or dial or a movable dial or reading face and a fixed indicator, as was the case in specification No. 1.

The further requirement of the specification is identical with the old requirement in the opinion of the committee.

6. All weight indicators shall be so designed and constructed that the indications are definite and may be read with precision.

This is to supersede specification No. 7 under the heading "Spring Scales," and is practically identical with the present specification.

7. All weight indicators shall reach to the graduations; or if the construction is such that the indicator and the dial or reading face are in the same plane then there shall not be a separation of the ends of the graduations and the end of the indicator, of more than 0.04 inch, this distance to be measured along the line of the graduations.

This specification is to supersede specification No. 6 under the heading "Spring Scales," and is practically identical with it.

8. When a weight indicator extends along the entire length of a graduation then all that portion of the indicator which may be brought into coincidence with the graduation shall be the same width throughout.

This specification is new and is designed to obtain a proper cooperation between the indicator and the graduations on the reading face or dial, so that the weight may be properly, accurately, and readily read.

9. *The clearance between the index of the indicator and the dial or reading face shall not exceed 0.06 inch in the case of all automatic-indicating scales except spring scales not equipped with a device intended to compensate for changes in the elasticity of the springs due to temperature effects; in this latter class of scales this clearance shall not exceed 0.12 inch.* Provided, however, That this shall not be construed to prohibit the employment of an additional indicator at a greater distance from the dial or reading face, designed and constructed so as to facilitate the correct positioning of the eye of the observer properly to read the indications of the scale and reduce parallax, when such additional indicator is clearly differentiated from the weight indicator so that it will not be mistaken therefor.

This specification is to supersede specification No. 8, under the heading "Spring Scales," reading in part as follows:

The distance between the indicator and the reading face shall not exceed 0.12 inch.

and which contains also the proviso contained in this specification. It also is partially to supersede specification No. 5, under the heading "Computing Scales," which reads in part as follows:

The distance between the chart and the weight and the value indicators shall in no case exceed 0.06 inch.

It will be noted that the present requirement is that computing scales have a clearance between the indicator and the chart of not more than 0.06 inch, and that spring scales other than spring-computing scales, and all other automatic-indicating scales, have a clear-

Digitized by Google

ance between the indicator and the reading face or dial of 0.12 inch.

Now the figures of 0.06 inch and 0.12 inch have been retained, but the classification of the scales to which these clearances apply has been modified to some extent as will be noted from the present wording suggested. It is believed by the committee that this classification is a better and a more logical classification than that which was formerly employed in the two specifications which I have read.

10. When tests are being made with both increasing and decreasing loads on any automatic-indicating scale, the indications on all increasing loads shall be within the normal tolerances provided, and also at any stage of the test the range between corresponding observations for increasing and decreasing loads shall not be greater than the sum of the tolerances in excess and in deficiency for the load in question.

This specification is at present contained under the heading "Scales—General Specifications," but it is specified that it is to be limited to apply to automatic-indicating scales; therefore, it seems apparent that the specification should be included here and that eventually the requirement should be deleted in its present position. There has been no change in the requirements of the specification.

11. An automatic-indicating scale shall be so designed and constructed that the element supplying the counterforce, such as the spring, the pendulum, etc., is securely held in adjustment and this element shall not be adjustable from the outside of the scale; that is, a partial disassembling of the scale mechanism or of the housing shall be required to reach any adjustable parts provided.

This is to supersede specification No. 11 under the heading "Spring Scales," which reads as follows:

No device to alter the working or effective length of the spring shall be placed on the outside of a spring scale.

You will note that the old language has been amplified not only to include all counterforce elements, in addition to springs, but also to require that the counterforce element be securely held in adjustment. In addition, it contains an interpretation of what is meant by adjustment from the outside of the scale.

TOLERANCES.—Except on the special tests described above, the tolerances to be allowed on any automatic-indicating scale shall be the tolerances allowed on the class to which the scale under test belongs; these will be found under the specific heading embracing such class.

You will note that there is no change in the tolerance provisions. Under the method of procedure proposed to be adopted, the tolerances now included under the heading "Large-Capacity Automatic-Indicating Scales" will be transferred to the heading "Platform Scales" and will be properly amalgamated with the tolerances already contained under that heading.

That concludes the report of the committee. As has been stated, that report is recommended for final adoption at this time, with the proviso that the requirements do not go into force and effect until July 1, 1931. It has further been suggested that, when these specifications go into force and effect, the other codes of specifications be amended in order to prevent duplication between the new and the old codes.

Mr. SWEENEY. Mr. President, I move the adoption of the committee report.

Mr. FLAHERTY. I second the motion.

Digitized by Google

The ACTING CHAIRMAN. It has been moved and seconded that the report of the Committee on Specifications and Tolerances on Specifications and Tolerances for Automatic-Indicating Scales be accepted, and the recommendations adopted. Are you ready for the question?

Mr. MARONEY. May I suggest to the committee that there is no specification offered for the width of the indicators that are used in conjunction with the various dials? May I offer the suggestion that the width of the pointer be restricted so that the end of that pointer shall not be greater in width than the width of the graduations on the dial? I offer this as a suggestion without going into detail on it. We all know that some pointers are unsatisfactory in this respect.

Mr. HOLBROOK. I think that is a very good suggestion. As a matter of fact, the committee had under consideration a specification along that very line; but before proposing a mandatory specification they desired to make a general study of the entire question of indicators in combination with graduations. The main complication is that continuous indicators on computing scales are employed to cooperate not only with weight graduations, but also with value graduations. I can assure Mr. Maroney the committee will have something to propose on this question at the next conference. It would have been proposed at this conference, but the time available to obtain the required information was found to be too short and, therefore, after considerable debate upon a specification which reached the rough-draft form, it was deferred for future action.

Mr. MARONEY. I thank you.

Mr. BRIGGS. Mr. Holbrook, in the specifications dealing with the dial graduations and other details, is there likely to be any confusion in interpreting these specifications in reference to an automatic indicating device, where optical means are employed—where the projected image of an indicator and scale may be used for reading?

MR. HOLBROOK. The device to which you refer was in the minds of the committee, as were all automatic-indicating scales with which we were familiar. At one time it was considered that a special specification might be included to cover this, due to the fact that the indicator and the reading face or dial in this case would be the shadow which is read on a ground glass face—it would not be the actual scale which projects the image. However, it seemed to the committee to be so obvious that the shadow scale and indicator which were read were the scale and indicator referred to in the specifications that it was not considered necessary especially to point that fact out in the specifications.

Mr. BRIGGS. You have covered the ground and considered that in preparing the specifications?

Mr. HOLBROOK. We consider the specifications are applicable to the machine which you mention.

Mr. BRIGGS. Proposed specification No. 9 reads, in part, as follows:

The clearance between the index of the indicator and the dial or reading face shall not exceed 0.06 inch in the case of all automatic-indicating scales except spring scales not equipped with a device intended to compensate for changes in the elasticity of the springs due to temperature effects;

There seems to be no reference to size of dial. It occurs to me that there is one type of scale which would be required to conform to this

Digitized by Google

clearance which might have difficulty, and that is these pendulum scales which have dials 3 or 4 feet in diameter. It seems that the matter of size of dial might be given some consideration in a provision of this kind. Manifestly, if you have a dial 4 feet across it would be much more difficult to maintain the necessary clearance for the satisfactory operation of the mechanism than when you have a small dial.

Mr. HOLBROOK. That is undoubtedly true, but the committee naturally desires to maintain the smaller clearance of 0.06 inch in all cases where it is possible to do so, in order to reduce the parallax and obtain as accurate a reading as may be from the combination. It was considered in relation to the class of scales that you mention that the machining of the parts is so carefully done, and they are arranged so truly within the scale, that the manufacturers would be able to live up to that requirement. If any difficulty is apprehended by the manufacturers the committee would be very glad to listen to their statements in that connection.

Mr. BRIGGS. In specification No. 11, a provision is introduced which, on careful reading and study, relates apparently to the adjustment of a device, and does not relate to the balancing of the scale.

Mr. HOLBROOK. This specification is not considered to relate to the ordinary balancing means, as that which changes the relation of the rack and pinion, for instance.

Mr. BRIGGS. You have in mind such changes as the effective length of the spring?

Mr. HOLBROOK. Yes.

Mr. BRIGGS. It occurred to me in reading it, however, that in the minds of some it could be very easily confused with the balancing arrangement, or the device used to set your indicator at zero. No sooner had that thought occurred to me than some one in this neighborhood commented on the making of the zero adjustment in such a case. Would it not be desirable to introduce a sentence making it clear that it is not intended to apply to the adjustment of the zero?

Mr. HOLBROOK. If the specification is likely to be misleading, I think it would be well to add a sentence indicating in effect that the requirement is not intended to apply to the ordinary balancing arrangement, commonly employed, and if the conference is willing, the committee would be very glad to frame a sentence along those lines and add it to the specification.

Mr. BRIGGS. Just one more point I have in mind, possibly a minor one. I find no reference to the word "symmetry" or "symmetrical" as a requirement for pointers or indicators.

Mr. SWEENEY. You will find that in specifications Nos. 7 and 8.

Mr. BRIGGS. The point I have in mind is that where the indicators are not symmetrical there are differences in personal viewpoints as to whether the observer is reading precisely on the indications. It would apply whether the pointer extended the full length of the graduation or not.

Mr. HOLBROOK. I think, Mr. Briggs, that is exactly the kind of suggestion the committee asked to be made, and the committee might very well give the question of the symmetry of the indicators consideration during the coming year.

Digitized by Google

Mr. HARRISON. I understand from specification No. 2 that you contemplate that certain graduations may be wider than other graduations. Reference is made to the fact that the graduations may not be wider than the clear interval between the graduations. Is it contemplated by the committee that the clear interval between graduations referred to should be maintained between the wider graduations and those adjacent to it, or is it sufficient to have the required clear interval between the graduations which are not so wide?

Mr. HOLBROOK. It would be my interpretation that no graduation might be wider than the clear interval between that graduation and the graduations adjacent to it. If it is desired to make the width of the graduation equal to the width of the clear interval between the graduations, in that case all of the graduations should be of equal width. I think it would be very unfortunate at any point on the dial to have any graduation which is wider than the clear interval between it and the adjacent graduation.

The ACTING CHAIRMAN. With the suggested changes which the committee will deal with in accordance with the expressed understanding,[5] we are now ready for the question on the adoption of the specifications as a whole.

(It was moved and seconded that the report of the committee be adopted as recommended, the question was taken, and the motion was agreed to.)

THE SUPPRESSION OF FRAUDULENT PRACTICES

By J. M. VANDERSLICE, *District Supervisor, Bureau of Weights and Measures, City and County of Philadelphia, Pa.*

Mr. President, delegates, and friends, the bureau of weights and measures of Philadelphia is composed of seven subdivisions, each one under the direction of a district supervisor, as follows: (1) Scales, weights, and measures; (2) commodities; (3) coal inspections; (4) purchasing of commodities; (5) inspection of drug scales; (6) gasoline and oil; and (7) milk bottles.

In Philadelphia 90 per cent of our prosecutions are based upon evidence secured by our own inspectors in making purchases of commodities, while the balance of our prosecutions result from investigations where we find dealers manipulating scales in various ways. Our method of investigation by making purchases of commodities is as follows:

In Italian, Jewish, or colored sections we engage by the day a woman of each respective nationality to do the buying; after the purchase is made she is met outside of the store by our inspectors, who accompany her back into the store. The goods are reweighed on the scales over which they were sold. If the weight is correct, usually the merchant is glad to refund the purchase price, thus enabling us to make many purchases without too great an outlay of money.

If the purchase is short in weight, the commodity is retained by our inspectors, we swear out a warrant, and the defendants are

[5] In accordance with this understanding the following addition was made at the end of specification No. 11, as read: "(This specification does not refer to the means commonly provided for adjusting the zero balance condition of a scale.)"

Digitized by Google

brought before the court. If the goods are perishable, they are given to some public institution as soon as possible.

On private complaints the same procedure is followed, when the buyer will make an affidavit, but sometimes it is very difficult to get these private complainants to appear. A recent example of this follows: On Saturday morning one of our inspectors noticed through the window of a certain store a woman buying a ham. He also noticed the butcher putting his hand under the scale and pulling it down. Our inspector stopped the woman outside the store and told her about it. The ham was brought into our bureau, and upon being reweighed it was found to be 1½ pounds short on a purchase of 6 pounds. This woman swore to the affidavit and the date for the hearing was set. On the morning of the hearing we called at this woman's home to take her to the court, but we were informed by her daughter that she was ill and unable to appear. We realized that she had been influenced to stay away. The butcher appeared at the hearing, and, of course, our case failed, no prosecutor being present.

The butcher told us the whole story. It appears that three days following the purchase this same woman called on the butcher to make another purchase, cautioning him to keep his hands off the scale and warning him that he was going to be arrested. The butcher told her he would take care of her if she would not appear at the hearing; she promised to stay away. All she got out of this was two small pieces of meat. Her husband earned $18 a week, and they had seven children.

So you will appreciate how difficult it is to get convictions. Some people make a practice of buying from these butchers, taking a chance of getting short weight; if they detect short weight, they demand money from the butcher, knowing that if he is arrested it will cost him much more. From our experience we have found that dealers in meats and poultry are the most flagrant offenders against the weights and measures laws and the most persistent in selling short weight. A number of dealers have been prosecuted and fined a second and third time.

Before the advent of the modern scale 80 per cent of the weights were incorrect. The worst weight ever confiscated by this office was a 4-pound weight that weighed only 2½ pounds. The chain stores operated by the large companies cooperate with us to the fullest extent. It is with the small dealer that we have the most trouble. When our bureau was organized 16 years ago we found that 90 per cent of the milk bottles in use would not hold their legal capacity, but after correcting this matter with the manufacturers we soon found the percentage of short milk bottles becoming smaller and smaller, and for several years past we have been unable to find an undercapacity milk bottle in Philadelphia. We have a special crew assigned to inspect drug-store scales and weights, who are particularly trained in that branch of our work and who devote their entire time to it. The situation on coal inspections in Philadelphia is very good; occasionally we find some dealer who attempts to sell short weight, very much to his regret.

Now, as to the gasoline and motor-oil proposition, I may say that we have about 9,000 gasoline pumps and many thousands of oil bottles

Digitized by Google

to look after. We have 22 inspectors to cover an area of about 133 square miles. Again it is the little fellow we have to watch. Since last September we have ordered destroyed about 500 illegal oil bottles. We found the small dealer using so-called Mason fruit jars for oil bottles; these were improper, for, in the first place, the content was not blown in the bottle, and then again they did not hold a quart. We usually give the dealer his choice of breaking them up while we are present, or having them confiscated by us, which means prosecution. He usually breaks them.

When we receive a complaint from some one who thinks he has received short-measure gasoline, I call upon the complainant and get the exact location of the pump from which the purchase was made. I then call at the gasoline station and make a purchase of gasoline from that pump directly into the "dummy" tank of my car, which I will describe later. A short distance away we drain this gasoline out and measure it. If this amount is short, some time within one week afterwards a second purchase is made in the same manner. If the second purchase is also short, we leave the car some distance away and return to the gasoline station on foot and test all pumps on the premises. This is about 10 minutes after the second purchase is made. The reason for allowing one day or more to elapse between purchases is to classify the seller as a persistent violator. If the pump from which the short purchase is made shows correct on the test, then the pump must have been manipulated on the sale. If the pump is short on test, then the sale was made from an inaccurate instrument. In either case a warrant is issued for the manager of the station. We have made many arrests for this violation and have secured 100 per cent convictions. Not one case has failed, nor has one case been appealed.

For the purpose of making test purchases I have a double tank on the back of my car. By the use of levers and a connecting pipe, this tank can be made into one complete running tank, or it can be separated into one-half running tank and one-half buying tank. We buy into the regular inlet of the tank. The other side has a "fake" gage cap which can be removed, thus giving me a separate inlet into each side of the tank if necessary.

I wish to say at this time I have this car outside and at the conclusion of this program, if anyone cares to have me do so, I will be glad to explain it and show them how we work it in Philadelphia.

The penalties in Pennsylvania are: For the first offense, $25 and costs, that is, $4; for the second offense, $50 and costs, that is, $4, and for each and every subsequent offense, a fine of not more than $100. In default of the payment of any fine as aforesaid, the person convicted shall be sentenced to serve one day in jail for each dollar of the fine and costs. This has proved so effective that in the last year we have not been able to catch the same offender twice. The worst buy we ever made was 2½ gallons for 5 gallons, from a condemned pump.

One particular case I would like to cite before closing is as follows: We received a complaint that short measure was being given at a certain place from a certain pump. I made five purchases from this pump—every one was short, varying from 30 cubic inches to 80 cubic inches. After the last purchase the inspector and myself re-

Digitized by Google

turned on foot and tested the nine pumps which we found on the premises; eight were correct; the one from which we bought short, showed short on test and, of course, we condemned it. We watched the place for two days to see if they continued to sell from the condemned pump. On the following day we attempted to make a purchase from this condemned pump, but the manager would not sell from it; instead he shifted us to the adjoining pump and we received short measure in the amount of 30 cubic inches from this pump. Needless to say, we swore out a warrant for his arrest, and he was fined $25 and costs, that is, $4.

DISCUSSION OF ABOVE PAPER

The ACTING CHAIRMAN. Does anyone wish to ask any questions on this paper?

Mr. CROCKETT. Mr. Chairman, I would like to ask what shortage is allowed.

Mr. VANDERSLICE. Seven cubic inches in excess or deficiency.

Mr. CROCKETT. Do you hold it to 7 cubic inches?

Mr. VANDERSLICE. Yes.

Mr. HOLBROOK. Mr. Chairman, in connection with the statement of the gentleman from Philadelphia that he has a test car here, I am also advised that the division of weights and measures of the city of Baltimore have brought over their decoy car used for the purpose of making test purchases of gasoline, and this may be examined by those interested during the noon recess in front of this building. James T. Everett will be in charge and will show how it operates. Thus we will have the opportunity to examine two cars at the same time.

The ACTING CHAIRMAN. This is a very interesting subject, and I have no doubt that many will enjoy the opportunity and privilege of examining these cars.

Mr. C. P. SMITH. Mr. Chairman, I would like to ask the gentleman from Philadelphia what allowance he makes for the liquid that might adhere to the sides of the tank and the hose.

Mr. VANDERSLICE. We never prosecute for shortages of less than 30 cubic inches.

Mr. AUSTIN. Mr. Chairman, Ralph Smith has asked me to give a description of our testing in Detroit; and if time permits, I would like to go ahead with that. In this connection I would like to ask the gentleman from Philadelphia a question: Do you buy this gas outright in Philadelphia?

Mr. VANDERSLICE. Oh, yes; we pay for it.

Mr. AUSTIN. The ordinance of the city of Detroit specifies that short weight is illegal in the case of any commodities purchased, sold, or exhibited or offered for sale, and a person is subject to prosecution for offering for sale a commodity short in weight the same as though it were an outright purchase. This has this advantage, that we can make many purchases and return the commodities if found full weight or measure. It saves the handling of the commodity. I will go over some figures briefly before I point out our method of buying.

Digitized by Google

The following results were obtained in a 7-day drive with one "buy car" operating:

391 5-gallon purchases (1,955 gallons handled).
54 shortages, from 1 pint to 1¼ gallons.
13.8 per cent of the deliveries were short measure.
Total fines, $1,140; average fine, $21 (approximately).

In a 3-day drive conducted very recently with two "buy cars" operating the following results were found:

382 5-gallon purchases (1,910 gallons handled).
40 shortages, from 1 pint to 1 gallon.
10.5 per cent of the deliveries were short measure.
Total fines, $790; average fine, $20 (approximately).

In the case of the latter work we have made conservative estimates as to what losses will result to the purchasing public, of the city of Detroit, from shortages such as in the following:

Total shortage on 382 purchases	ounces	1,365
Average shortage per sale, approximately	do	3½
Approximate number of sales per day at each station		50
Number of filling stations in Detroit	gas stations	1,400
Total shortages per day, 245,000 ounces	gallons short per day	1,914
Steal per day		$382.80
Steal per month		11,484.00
Steal per year		137,808.00

You can see the seriousness of this shortage of gas—it amounts to considerable when you get down to figures. In just a moment I will explain what a "buy car" is.

Now, we find that when we make a drive the word flashes about the city in the shake of a lamb's tail. We find that after we have been out operating our buy cars for two and one-half days, the number of shortages decreases. That shows that the element of advance notice must be eliminated and this is how we go about it to eliminate that.

Most of these drives we put on over the week-end. We start about 10 o'clock Saturday morning, and about the same time the last loads of gasoline are leaving the refineries for the last trip on Saturday. They return to the refineries about 1 or 2 o'clock in the afternoon. So shortly after we start out, the tank wagons are returning to the station, with the result that this means of communicaion is not possible. Telephones have been eliminated from all company stations, so news is not likely to spread in that manner. The main thing in a gas drive is to make as many stops as you can and in as short a time as possible. By the method which we have adopted, we make a gas purchase every eight minutes; when using the two buy cars we can make two every eight minutes, or one every four minutes.

The last drive described was a 3-day drive and we made 382 purchases covering almost one-fourth of the gasoline filling stations in the city in three days. Now, it will be interesting to point out how we were able to make three hundred and eighty-two 5-gallon buys in three days. We use in connection with one "buy car" two "follow-up" cars which carry the measuring equipment. As it takes about twice as long to check as it does to make the purchases, you can see that one buy car will keep two follow-up cars busy. The buy

Digitized by Google

car comes in and makes a purchase at a station. Immediately after the delivery, the question is always asked of the operator as to the cost, so as to commit him to the fact that he understood what was asked for. For instance, if you have asked for 5 gallons of gas and he quotes you the price of 4, you know he has misunderstood you, but if he quotes the proper figure for 5 gallons there is no question about a misunderstanding. Just the moment delivery has been made to the buy car the follow-up car drives up and makes a test of the gas delivered; in the meantime the buy car is proceeding to the next station, where a purchase is made, and this time the second follow-up car makes the check; and so on.

In that way it is possible to make a stop every eight minutes with the buy car and if you are lucky enough to have two buy cars you can double the speed of the work.

Mr. CROCKETT. Are these tests made right in the station?

Mr. AUSTIN. These tests are made at various stations, but they are not made at every station along the street.

Mr. CROCKETT. Do they make the measurement right at the station?

Mr. AUSTIN. Yes; the measuring of gas is done right in front of the operator.

Mr. MARONEY. Mr. President, may I ask Mr. Austin a question? You tell about the loss of gasoline, but say nothing of pumps that were in excess.

Mr. AUSTIN. You do not find many.

Mr. SWEENEY. What did you find?

Mr. AUSTIN. We do not keep a record of it. I would simply say there are few overdeliveries as much as 7 or 8 cubic inches; sometimes you might get a half pint over.

Mr. MARONEY. Then your figures are unfair when you quote the percentage of the total loss to the consumer, because if at one station one pump is over and one is under, the discrepancies tend to cancel each other, and there may be no net loss to the average consumer. If you neglect overdeliveries in your figures the total loss in your city is not what your figures show.

Mr. AUSTIN. Surely.

Mr. MARONEY. With a temperature above 90°, for instance, the expansion might make a considerable difference. Again, suppose the drainage of the hose is not perfect. In other words, suppose in draining a partial vacuum was created and you found the shortage was due to the fact that liquid was retained in the hose. Would that bring a prosecution?

Mr. AUSTIN. We do not pay any attention to what may be left in the hose. There are cases where we found they made a practice of holding some part in the hose, afterwards pouring this back into storage; so any gas which is not actually delivered is not taken into account.

Mr. MARONEY. Suppose a 7-cubic-inch tolerance is allowed; would you prosecute a man on a shortage of 7 cubic inches in 5 gallons if you found 7 or 8 cubic inches had been retained undelivered in the hose—gas which he would have delivered to you had the hose drained properly?

Mr. AUSTIN. All we take into consideration and the only thing in which we are interested is a shortage of 1 pint or over.

Digitized by Google

Mr. MARONEY. And if there is excessive heat in your town which expands the relief valve and it does not work as it should he is a violator of the law?

Mr. AUSTIN. Yes; the seller is responsible for what is delivered.

Mr. VANDERSLICE. I would like to say, Mr. Chairman, that we use New Jersey tags when we make test purchases in Pennsylvania for the reason that all the stations are familiar with the Pennsylvania numbers that we use. I would like to ask Mr. Austin what kind of a tank he buys in.

Mr. AUSTIN. Our tanks are designed with a funnel-shaped bottom and a pipe leading from the back of the car.

Mr. VANDERSLICE. If you are not going to buy for checking purposes, would you buy into the same tank?

Mr. AUSTIN. No; we use a different tank for the fuel supply. But the original tank is the one used in the check purchases. We use several different makes of cars, and the tanks are in the original place but they are redesigned for this special purpose by pulling out the ends and putting in a false bottom so that it all drains to one point.

Mr. VANDERSLICE. I do not think that would go in Pennsylvania.

Mr. AUSTIN. Well, it goes all right in my city.

Mr. SCHWARTZ. I want to say, Mr. Chairman, for Mr. Vanderslice's information, that we use Pennsylvania tags when we make check purchases in New Jersey.

THE ANNUAL REPORT OF THE OFFICIAL

DISCUSSION OF THE SCOPE AND PREPARATION OF THE REPORT

By H. S. JARRETT, *Commissioner of Weights and Measures, State of West Virginia*

Mr. Chairman and members of the conference, one can not help but note the wonderful progress that is being made in weights and measures administration throughout the various States. This is evidenced, of course, from the State reports and the excellent papers that have been submitted to this conference. In this paper that I am submitting to you to-day I have embodied some ideas that I have had as to future progress in the work, and I trust you will bear with me just a few minutes until I can dispose of this.

The compilation of annual or biennial reports of State, county, and municipal weights and measures officials composes an important part of the work of every department. Those charged with the duty of compiling these reports are required to delve into a mass of tabulated transactions of sealers and cull from the conglomeration of figures that portion which in their opinion is not essential. Then there is usually left a bare skeleton of the real information which should be disseminated. The compilers of the report are required to familiarize themselves with a whole year's activities of the sealers if they are arranging an annual report, and they naturally become acquainted with every detail entering into the work of the field force. But what other person or persons have such information? The individual officials know what has transpired during the period, yet when the report is printed and distributed, have they submitted statistics

Digitized by Google

that will enlighten and interest the public and place the departments in a position where they receive the recognition due them?

When our reports are ready for submission to the proper authorities they are frequently in a form setting forth, principally in figures, data showing so many scales or other equipment tested, adjusted, condemned for repairs, or confiscated, leaving the reader without sufficient knowledge to pass favorable judgment on the work. The question that confronts us is: "Have we been submitting adequately definite, intelligible, and convincing reports to justify impartial opinions that our departments should be given encouragement through additional authority and enlarged appropriations to effectively carry on the work?"

It is not my purpose in this paper to constitute myself a board of censors or endeavor to pass judgment on those invested with the responsibility of preparing and submitting reports. I am guilty of the general practice of indiscriminately and hastily collecting and assembling a lot of figures and calling it an official report, when in fact I must admit it has a very slight semblance of being what a comprehensive document should be. Year after year we hear reports that legislatures or other tribunals decline to increase appropriations or else curtail the appropriations made in previous years. What is the reason for their action? Every weights and measures department is conscientiously doing effective work in an efficient manner. They are saving to the purchasing public thousands of dollars and at the same time protecting the honest merchant in his daily transactions. We have not failed in our duty as conservators of honest weights and measures, but we have been derelict in letting the public know what is actually transpiring within the departments. Far be it from me to shout our virtues and withhold our deficiencies, but we have been prone to enlarge upon numbers and neglect attention to more distinctive features.

While our reports may be sought by those directly interested in weights and measures, I contend that others should manifest a desire to acquaint themselves with our work. I am positive that if our reports were made more informative, more attractive, and more useful for reference, we would then gain prestige and advance with greater strides in the future than in the past. It is my candid opinion that our reports can be made so impressive they will leave within the minds of the reader a more wholesome and popular conception of the duties and responsibilities of a weights and measures official. To this end it is my desire to offer a few suggestions rather than continue pointing out our imperfections and discrepancies.

Our reports are incomplete in the first instance from the fact that we fail to analyze the data presented. For instance, we prepare, and find it no small task, a number of tables with the idea of setting forth just what the various sealers have found in testing scales and other devices. The daily reports of inspectors sent to the central office of the department are of such a nature that the chief may grasp in an instant the problems and difficulties confronting the sealer. If the sealer is seeking advice, that advice is readily given and the correspondence ends. When the annual report is prepared it discloses just another scale condemned for repairs, yet many letters and expressions of opinion may have passed between the officials.

Digitized by Google

I fully realize that it would be impracticable to analyze each transaction, but it would serve a beneficial end if 10 or 12 special occurrences were to be picked at random and analysis made for publication in the report. Such analysis would serve a twofold purpose. A digest of each case selected for comment would acquaint the public with situations where they would become observers at every weighing and measuring transaction in which they are involved. The public would be sold on the effectiveness of our work and the necessity for extension of our activities. Then, again, the report would serve as an instructive document in the hands of officials. They would know how certain problems were solved in a sister State and would be afforded aid in solving problems arising in their own State. We will have accomplished great results if we can create a closer relation between the public and the official.

It is my contention that numerical results should also be expressed in percentages and these results carried over for a certain number of years, that all may determine at a glance what progress, if any, is being made. A general scheme of arrangement or analysis from year to year would facilitate the work of having to delve into former reports to find what has been accomplished in the past years. The tabular forms would condense these data, yet present just the information we are compelled to seek when presenting our claims of advancement. All such items should be reported on concisely but fully, and all special activities made a part of the report. Future plans should be outlined briefly to include recommendations for amendments to present laws, increased operating funds necessary, new equipment essential for expansion, and other requirements peculiar to each department, setting forth explicitly why these recommendations should be favorably considered.

The frequent use of cuts with descriptive matter adds untold interest to any report. Their use would serve to far greater advantage than pages of technical analysis that leave the reader unenlightened. Example is the school of mankind and many will learn at no other. Example preaches to the eye and often leaves a deeper impress than volumes of counsel addressed to the ear. A lesson once thoroughly comprehended is indelible.

An inventory of our equipment should be included in the report to show the vast amount and varied articles necessary for use in our work.

Exceptional violations where court action has been found necessary could be so given in detail as to strengthen confidence in our veracity and confirmation in our exercise of authority.

Judicial opinions affecting some phase of our regulations, and amendments to statutes, should be given following the rendering of these decisions or legislative enactments.

A résumé of the more important topics considered at conferences should be briefly summarized.

I do not feel it would be amiss to create in this conference a committee, to be known as a committee on the compilation of State reports, whose duty it would be to work out a model form to be followed, if we so desire. I am sure we can enlist the services and advice of the Bureau of Standards on this question and I am certain the officials of the bureau would give to us the benefit of their experi-

Digitized by Google

ence, together with suggestions and counsel in this matter the same as they have in so many other problems in which we have sought their guidance.

Usually our reports are compiled at the end of the fiscal year when we have used up almost all of our appropriation and as we are compelled to keep within the specified allotment, we are required to reduce the material to a minimum. It would be well to estimate early in the year when appropriations become available just what will be required for our report and then govern ourselves accordingly.

The better the reports of our work, the more emphasis will then be placed on our needs, but if we continue to present unintelligible reports and conclude by urging that our recommendations be carried out, we have not convinced anyone of the necessity for the appropriations which we have recommended.

I feel our reports can be made to serve as a message, presenting our activities so forcibly that we will not have to stress our needs but those needs will be readily recognized. I feel positive that if we attach greater importance to the preparing of these reports the confidence of the public will be retained and we shall receive grateful acknowledgment as a reward for our efforts.

GRAPHICAL PRESENTATION OF DATA

By Henry D. Hubbard, *Bureau of Standards*

This century has seen an astonishing rise in the use of graphic methods. These translate into vivid diagrams the statistics which would otherwise be difficult to analyze and compare.

Weights and measures officials may well adopt methods so successful in other fields, notably in science where the use of graphs is universal. The clearness, force, and interest which graphs introduce improve the presentation of data and enliven the dull and neglected columns of Arabic numerals which we call statistics.

Without effort graphs give the eye and mind an instant grasp of magnitudes and their relations. Comparisons of quantities and numbers become automatic. Graphs speak the language of pure quantity. They may show the rise and fall of activities, their maxima and minima, and their averages. They are self-interpreting. In brief, the mind can begin its study of the data where such illuminating diagrams leave off, at a point far in advance of mere tabulation.

I have prepared a special series of graphs of interest to weights and measures officials. The literature of graphical methods is becoming very rich, and numerous books and articles can be commended for study of scope and method. In this talk, however, I shall sharply limit myself to a few types of graphs which might be useful in weights and measures records and reports.

Figure 1 shows for every year since 1915 the percentage of railroad track scales tested and found within tolerance. The time scale runs from left to right by years, the percentage scale runs from 0 to 100 upward at the left edge, and the resulting history curve gives a vivid impression of the advance in the accuracy of railroad track scales during the past 14 years.

A second kind of graph (fig. 2) might be called a "percentage analysis graph." Five varieties of weights and measures are studied.

Digitized by Google

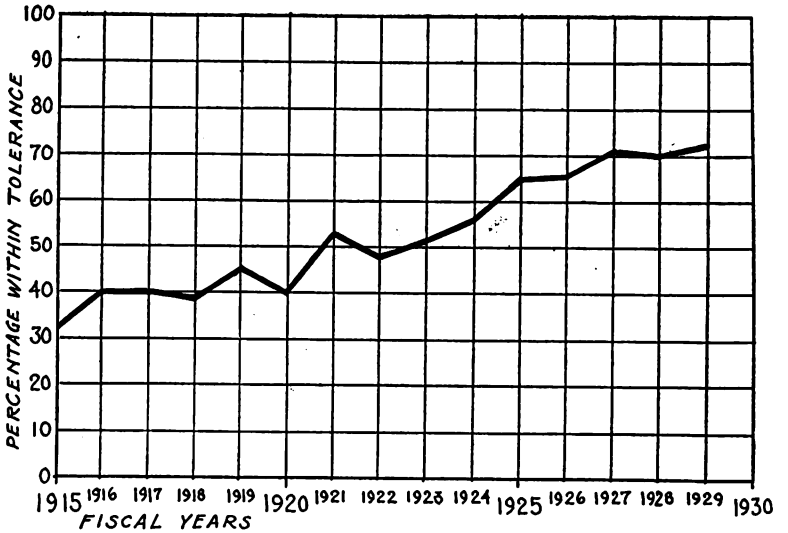


FIGURE 1.—*History graph, showing for track scales tested, the percentages found within tolerance by years 1915–1929*

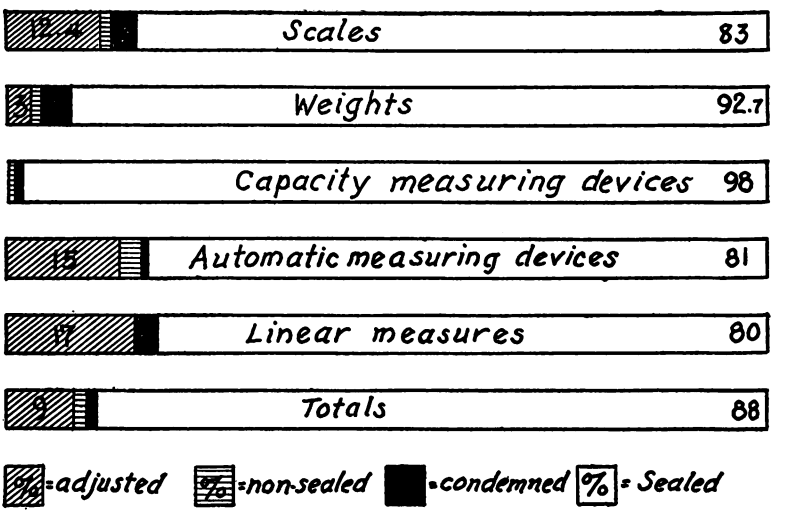


FIGURE 2.—*Percentage analysis graph, showing for each of five kinds of measuring devices the percentages, respectively, sealed, condemned, adjusted, and nonsealed*

Digitized by Google

The white portion of each bar is proportionate to "sealed" devices; the black part shows the percentage condemned, the part shaded with sloping lines shows the percentage adjusted, and the part shaded with horizontal lines shows the percentage nonsealed. The full bars, all of the same total length, represent 100 per cent and are subdivided to show the proportions of the components, as indicated by the key. A comparison with the grand total percentages can readily be made by the eye. May I suggest the extremely useful purpose which percentages serve? The mere numerical totals may vary from place to place quite arbitrarily. The percentage analysis is, however, an important means of studying how well the sealer's work has been done or how well the trades meet the legal requirements as to weights and measures. Numbers alone are purely quantitative. The percentage analysis, however, is interpretive and useful in diagnosis of status and trend.

The percentage analysis is so important that I will show another type of graph (fig. 3) which has certain advantages over the preceding. Here is a percentage analysis in which the percentage of each component begins at the same zero, the vertical line at the left. This permits a direct comparison of each percentage with all others and with the grand total at the foot of the graph.

The fourth (fig. 4) is an organization graph of a typical weights and measures office of a large city. Vertical lines show subordination and horizontal or oblique lines show collaboration. The lines of authority are definite, even if actually complex. The units of the organization and their interrelations are shown graphically with a clearness which verbal description can not approach.

The next two graphs are of administrative interest, and show inspections by months or seasons. In the first (fig. 5) the monthly totals are plotted as points to scale above the zero line. The horizontal reference line at a height representing the monthly average, permits instant comparison of the monthly totals with this average. Note that March, May, August, and December are average months, April and October are peaks, and the minimum is in June. Seasonal and monthly deviations from the average are clearly shown by heavy vertical lines.

The same data are shown in Figure 6 by a circle graph, well adapted to portraying cycles. Each of the 12 radii represents a month. Along these the number of inspections is plotted as a distance from the center of the circle. Note that the circumference of the circle itself represents the monthly average. January, February, June, and July are, obviously, less than the average, and the peak months stand out sharply beyond the average. Also see how vividly the black parts show monthly totals below or over the average.

In our next graph a total is analyzed into its component parts. A sealer may inspect 100 weights and measures, approve 70, reject 20, and condemn 10. These four facts are readily shown by the graph. (Fig. 7.) A circle divided into sectors shows subtotals both by percentage and by numbers, and shows the grand total in like manner as the sum of the subtotals. The areas of the circles repre-

Digitized by Google

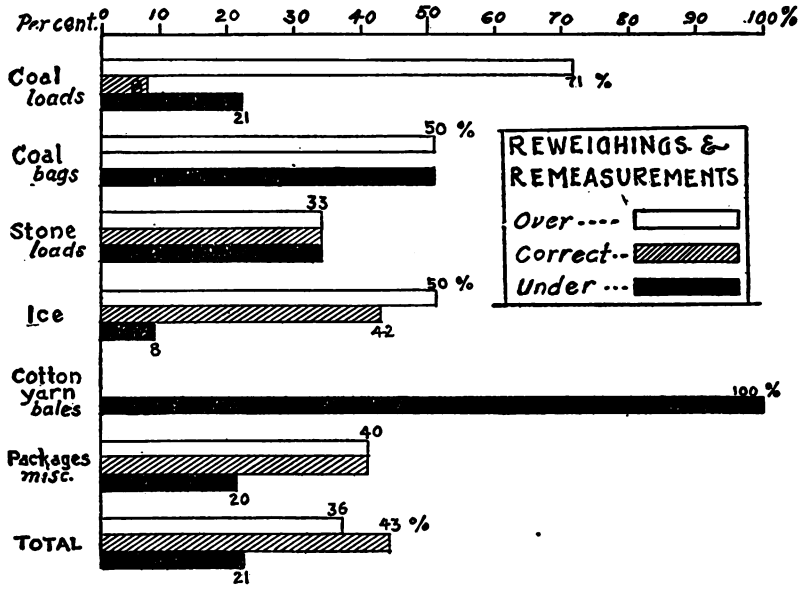


FIGURE 3.—*Percentage analysis graph in which each component is plotted from a common zero to represent a percentage of each aggregate*

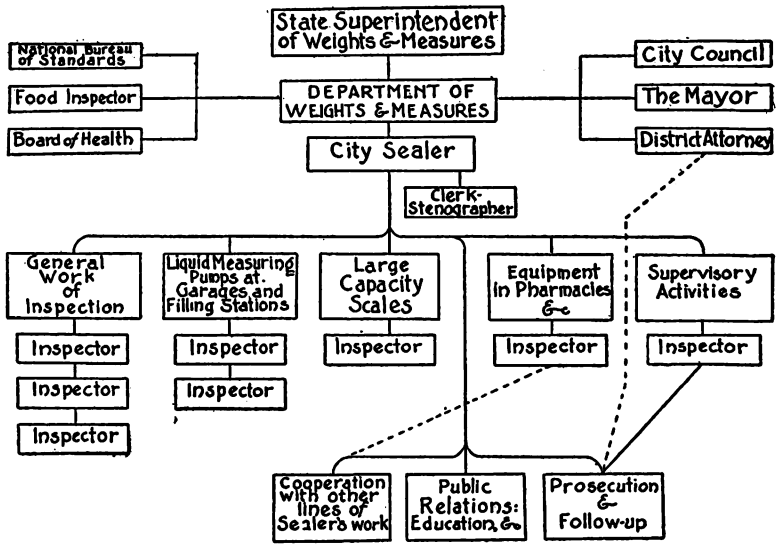


FIGURE 4.—*Organization graph showing the organization units and personnel and their interrelations*

Digitized by Google

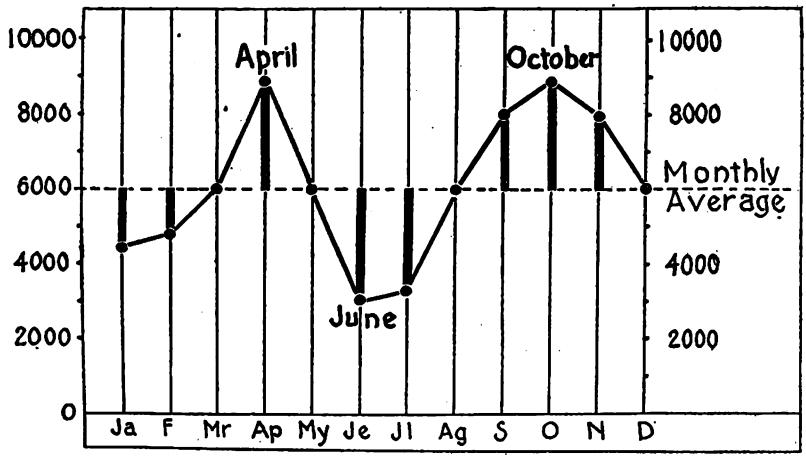


FIGURE 5.—*History graph and reference average level showing comparison of monthly totals of inspection and deviations from the average*

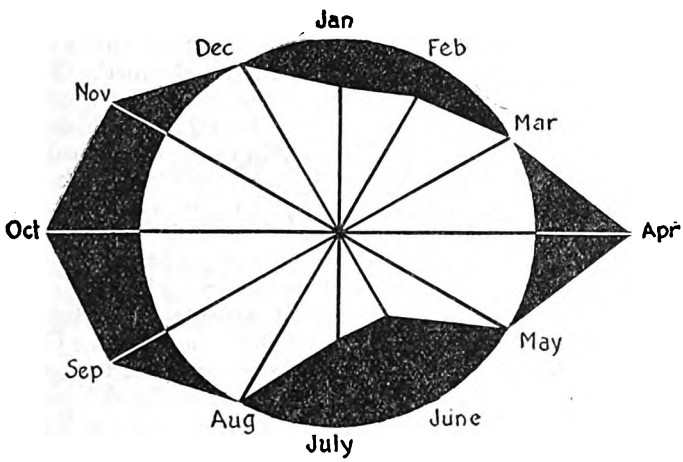


FIGURE 6.—*History graph and reference average circle showing by "cycle graph" the monthly totals of inspections and deviations from the average*

Digitized by Google

sent grand totals. Conceivably, the grand totals may vary without change of percentage composition, since the angles of the sectors indicate the percentages, the entire circumference representing 100 per cent (1 per cent=3.6° of arc).

Figure 8 shows both numerical and percentage analysis of track-scale tests made by the National Bureau of Standards in 1929, respectively, for the West, South, and East, and for the entire country. In each test a scale has "passed," or has failed by giving either "excess" or "deficient" indication of the weight of the test standards. This is a convenient and useful combination of percentage and numerical analysis where a study is to be made. The analyzed total for the United States is shown at the top, the units for the East, West, and South being placed as they would appear on a map, respectively, in the eastern, western, and southern parts of the United States.

A very useful but unusual type of diagram is the equilateral triangle graph. (Fig. 9.) Each corner of the triangle represents 100 per cent of one of the three components. The points along one edge portray all possible proportions of two components, the mid-point representing a 50:50 2-component aggregate. Within the triangle the points represent all possible proportions of the three components of an aggregate. Here each point portrays three components of a total; for example, the center point represents three components in proportion 33⅓ per cent each.

Each point is located by plotting its three elements in turn toward the respective angles A, B, and C, from the opposite edge as a base. The 100 per cent interval from the base to the angle opposite is divided into 10 steps of 10 per cent each.

A single point near the apex represents 80, 10, 10, respectively, and might signify, for instance, that 80 per cent of the weights and measures were approved, 10 rejected, and 10 condemned. The history of such a fact can be plotted on the same graph by a single point each year, the series of annual points showing the history of the three component proportions. The advantages of recording status and trend so vividly, comprehensively, and simply are obvious.

Another and most interesting type of graph, known as the "distribution graph," is shown in Figure 10. Here is an analysis of gasoline deliveries from various types of liquid-measuring devices, according to rate of delivery and jurisdictions where the data were secured. The grand total for each delivery rate is the height of the black column and is given numerically below the graph. The sections of each column are numbered to indicate the jurisdiction, each numbered section having a length proportionate to the deliveries in the jurisdiction concerned. It is seen that there are no deliveries at 1 gallon per minute, nor at 18 gallons per minute, and that the maximum number of deliveries is at 10 gallons. The figure as a whole shows a fairly symmetrical distribution of deliveries and would be well worth studying as to detail.

This graph was used with more detail by your secretary, Mr. Holbrook, in presenting to the conference the results of a survey of gasoline-measuring devices made by various officials, and presents a most useful method of analyzing results for detailed study. Note how easy it is to ascertain and visualize the effect of any proposal to limit

Digitized by Google

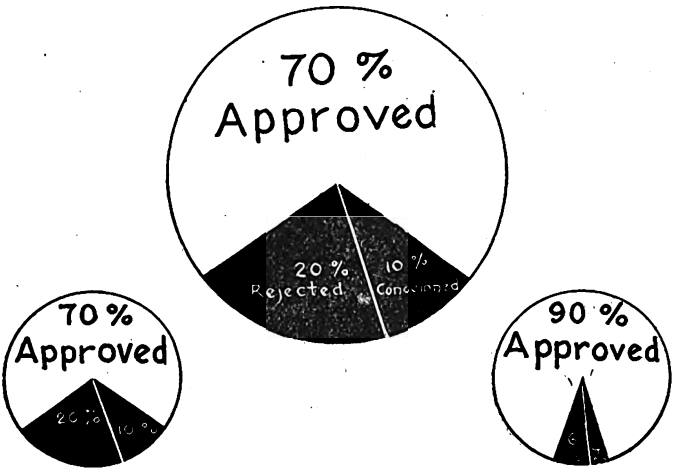


FIGURE 7.—*Percentage analysis circle graph, showing the percentages, respectively, of approved, rejected, or condemned apparatus*

NOTE.—In a circle graph, the area of the circle represents the grand total of units considered in the analysis. Thus, in the graphs above, the upper circle represents a total much larger than either of the lower circles; the small circles, being of equal area, represent equal totals. A given angle represents the same percentage, whatever the area of the circle. Thus, considering the upper and lower left circle, the percentages shown are the same, although the number of units comprising these percentages are much larger in the case of the upper circle. The two lower graphs illustrate an analysis of conditions before and after an effective campaign of active inspection; the total number of pieces of apparatus examined (as shown by the areas of the circles) is the same in each case, but a decided improvement in conditions is strikingly brought out by the larger angle indicating "approved" apparatus and the reduced angles indicating "rejected" and "condemned" apparatus.

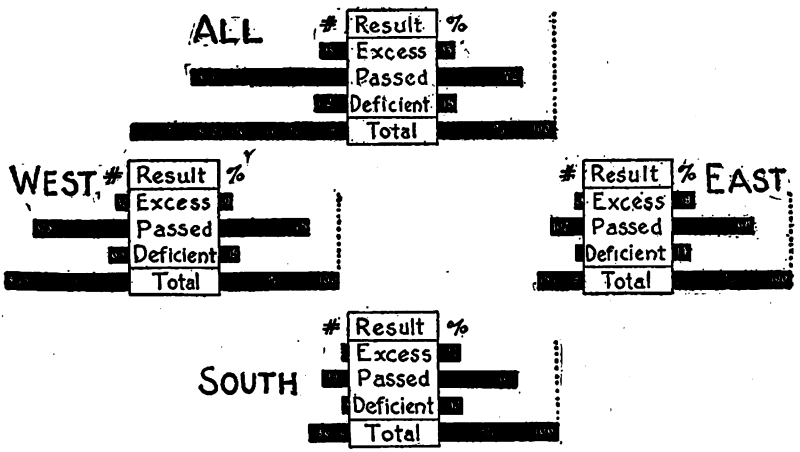


FIGURE 8.—*Numerical and percentage analysis of track-scale tests, shown separately for the eastern, western, and southern sections of the United States and for the entire country*

Digitized by Google

deliveries within certain definite maximal and minimal rates of delivery. The number of deliveries affected by any such limitation is quite readily seen from the graph.

The graphic language is modern. We are learning its alphabet. Graphs depict magnitude to the eye. They do more—they compel the seeing of relations. Stripped of needless words, reduced to di-

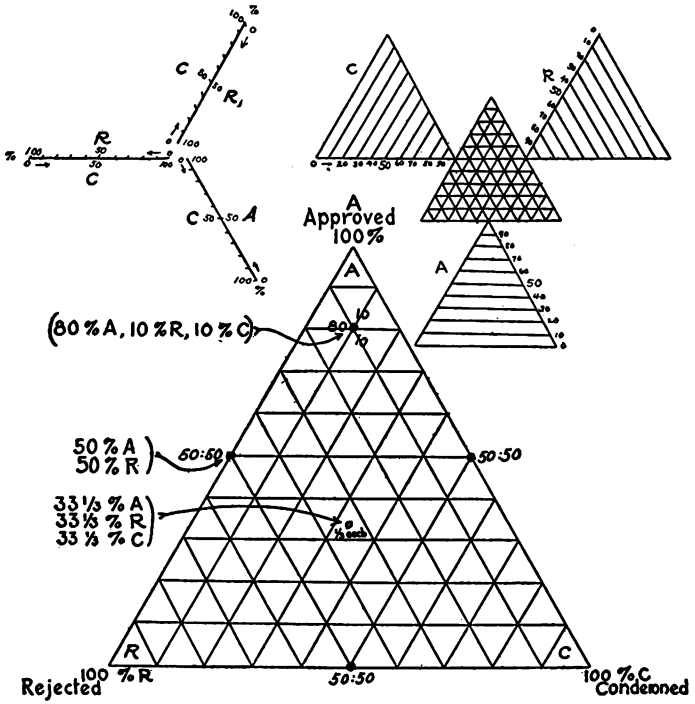


FIGURE 9.—*Triangular percentage analysis graph, each interior point representing the percentages of three components of a 100 per cent aggregate*

mensions, a language of quantity, vivid and unescapable. By graphs we can portray whole masses of intricate routine or the organization of an enterprise. The profile of a curve reveals in a flash the whole situation. Graphs furnish unrivaled means to record data and to tell facts. Combined with the essential numerical data which may be added to the graph, the story is complete. As weights and measures officials, we may profitably add graphic methods for recording or reporting our results, in view of the phenomenal success of such methods in other fields.

Digitized by Google

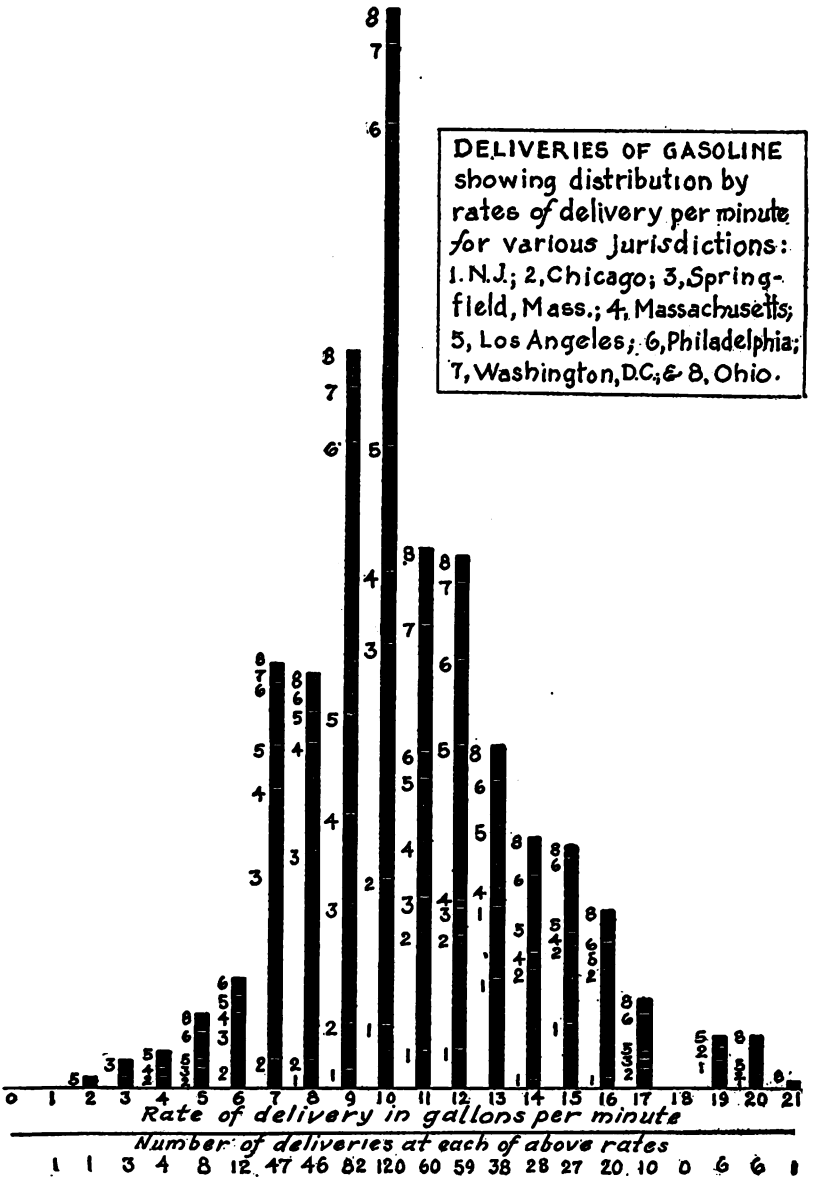


FIGURE 10.—*Distribution analysis graph, showing for each rate of delivery (gallons per minute) of gasoline, the total number of deliveries in all and for each jurisdiction*

Digitized by Google

DEMONSTRATION OF GASOLINE METERS BY MANUFACTURERS

The ACTING CHAIRMAN. It is now time for the demonstration of gasoline meters by manufacturers. I will request each demonstrator to confine himself to a period not in excess of 15 minutes, of which a matter of 5 minutes may be devoted to the answering of queries.

There are a number of presentations to be made, and these demonstrations will extend into the afternoon session. At this time we might determine the order in which the manufacturers will be heard and continue with the number until the time for the luncheon adjournment arrives.

Mr. HOLBROOK. Inasmuch as the order of presentation may be a matter of importance, I have written out the names of the manufacturers who will exhibit on these slips; I will shuffle them and Major Meredith will draw them at random. If he will read the names, I will write them on the blackboard, and everyone will then know the order in which the manufacturers will exhibit.

* * * * * * *

SECRETARY'S NOTE.—At this point, and continuing immediately after the luncheon recess, the manufacturers brought before the conference samples of their meters, so disassembled that they were enabled to explain and demonstrate them to those in attendance. Particular attention was given to the manner in which the product functioned, the method of manipulation of the adjustments provided, and the answering of questions asked by members. While a stenographic record of the remarks was made, it was later found that it was practically impossible to follow this transcript intelligently when the meters were not before the reader. Therefore no good purpose would be subserved in printing this material here, and it has, consequently, been omitted. It may be said in passing that this number was of great interest and value to those in attendance and that the formal appreciation of the conference was later expressed to the manufacturers taking part. (See resolution of the conference on this subject, p. 145.)

(During the number described above, at 1 o'clock p. m., the conference took a recess until 2 o'clock p. m.)

Digitized by Google

SIXTH SESSION (AFTERNOON OF THURSDAY, JUNE 5, 1930)

The conference reassembled at 2.18 o'clock p. m., Howard S. Jarrett, second vice president, in the chair.

DEMONSTRATION OF GASOLINE METERS BY MANUFACTURERS—Continued

These demonstrations were continued until 2.50 o'clock p. m., at which time the list of manufacturers participating was complete.

DISCUSSION OF ABOVE NUMBER

The ACTING CHAIRMAN. The conference feels very grateful for the demonstrations you have given us.

The meters will be here on display, and any time anyone desires to examine them and have them further explained I am sure the representatives of the meter manufacturers will be glad to explain them to you.

Mr. FOSTER. Mr. Chairman, if I may be permitted, I would like to call the attention of the manufacturers' representatives who are here to-day to something that we are all aware of. I have noticed that several of these meters are equipped with a bell. From my standpoint and as a result of my observation I wish the bell was not incorporated in either the piston-type or the meter-type pump. I say this because I believe the operator is unduly influenced by the bell. For example, on the piston pump we have had very much difficulty in that the operators stop when the bell rings. There is a very important difference between that condition and where the bell continues to ring until the indicator has dropped to zero. We have had a considerable number of complaints on that. I would like to see the meter manufacturers get together and dispense with frills which in my opinion are absolutely unnecessary.

AIR RELEASES ON POWER-OPERATED GASOLINE-DISPENSING UNITS

By A. W. SCHWARTZ, *Assistant Superintendent, Department of Weights and Measures, State of New Jersey*

Mr. President, members of the conference, and guests, it is a well-recognized fact that gasoline is a commodity of value, and it is therefore essential that it be sold through an accurate measuring device.

To place in the field a gasoline dispenser that would meet this requirement and also stand up to the specifications and tolerances as promulgated by the National Conference on Weights and Measures has been the aim of the manufacturers of the various devices now upon the market, and their engineers have given much time and study toward the development of apparatus to meet this demand.

Digitized by Google

From the early types of piston and visible pumps great strides have been made in the progress of the industry, so that to-day meter systems are displacing the old-style method of dispensing gasoline. It is being daily demonstrated that the meter type of apparatus is becoming more popular.

In making sales of gasoline at a supply or service station it is not only desirable but essential to expedite the delivery, and it is therefore an advantage to the trade to have a suitable supply pressure as well as to operate the device at its maximum delivery on all occasions. To this end have been devised various types of power-driven meters.

The flow meter was the first in the field. Within the past year there has been a trend toward displacement or volumetric metering pumps. This started first with one, and now most of the leading pump manufacturers have a device of this type on the market or in the experimental stage.

While this type of pump has many advantages over the old "blind" pump, with its leaky foot valves and worn suction leathers, the "visible" pumps, with their 2-way valves and remote control on the nozzle, and even over the "flow" meter pump, whose accuracy is dependent upon by-passing a certain amount of liquid to make up deficiencies that are caused by the inability of a flow meter to register 100 per cent of the delivery, it has an inherent weakness that is present in all pump devices, and that is the inability to pass off air in the line and measure only gasoline. A measuring chamber will record as full capacity of fluid, whether there is no gasoline in it or whether the gasoline contains large quantities of air.

The latest step in the progress toward 100 per cent accuracy is the air-release device. This apparatus has appeared on the market within the last year. A pump with an "air regulator," an "air release," or whatever a manufacturer desires to call it, will extract the air and insure that only fluid enters the measuring chamber. It is claimed that the device thus removed the last weakness in the performance of meter pumps, and that the purchasing public is sure of a full quantity of gasoline being delivered to the car.

There are a number of reasons why air enters the gasoline line between the underground tank and the meter: Leaking lines, loose connections, air pockets, excessive lift, mechanical leaks, leaky foot valves and line valves, low level of liquid in the storage tanks, or an empty tank. It is well known to weights and measures men that many of these faults are attributable to poor installation of the pumping unit, due to the oil company letting out the installing of the pumps to the lowest bidder, with the result that the most experienced mechanics are not employed on the job. Tanks are placed in the ground rapidly with the fill shoveled in hastily; rain will settle the dirt and cause pipe lines to shift, straining the connection; rain may settle the dirt under the pump pedestal, causing it to go out of plumb; carelessly connected pump lines with too little litharge at the threads may spring a leak under pressure. When a pump is operated at night the operator at the nozzle may be unaware of the fact that his gas level has dropped too low or that the tank may even have gone dry. All of these factors make it possible for the automobilist, the man who pays for a certain amount of gasoline, to

Digitized by Google

be defrauded, intentionally or unintentionally, by the station attendant. The fact remains that he often pays for more gasoline than he receives, whether the short measure is premeditated or is accidental.

It has been contended by some that the installation of the air release or regulator on the gas line before it reaches the meter will eliminate this short measure. From blue prints and diagrams the innovation appears to have solved the problem, but in practice the device is too new on the market to really prove that it is the panacea for the inherent ills that beset the pump.

You all know that the visigauge, the "see-glass," or whatever you may call it, has done much to take the mystery from the delivery of gasoline through the pump to the fuel tank on the automobile. Whether you are sure of getting what you ask for, the visigauge gives you a glimpse of the commodity in motion between tank and car. Since the visigauge is at the highest point on the line, it reveals to the operator and the observant driver when air is in the line. Bubbles are seen drifting through the agitated fluid, which is an indication of air, and that a resultant short measure is being delivered. A visigauge will reveal any air bubbles that enter the gas supply line through any of the causes I have enumerated above, but this is only shown after the fluid has been measured.

The testing of a pump by weights and measures officials may reveal a shortage that is greater than the tolerance allowed, and this shortage may be due to air in the line being measured and metered. This would cause the vigilant official to condemn the pump for adjustment, but since most States require only an annual test of each device, the pump may be wrong for a lengthy period without discovery. An air-release device would act as a constant guard against air mixing with gasoline and being measured as such.

Naturally the device has its drawbacks. It protects the customer, but it does nothing for the dealer, who may be losing thousands of gallons of gasoline through underground leakages that will not show above the surface of the earth. Not only would this amount to a considerable sum of money over a period of a year, but it would also create a fire hazard that could cause serious loss of life and property should the impregnated ground ignite and explosion occur.

The question of air in connection with gasoline dispensers has always been an important factor for serious consideration since the days of the first gasoline outfits, and it is submitted to you by the State department of weights and measures of New Jersey that in the power-driven types of metering equipment it is possible to provide practical and dependable means for eliminating this undesirable factor.

The subject of air-release devices is one on which the State department of weights and measures of New Jersey has an open mind, and it is felt that it should not be accepted as a cure-all for short measure of gasoline, simply because it is an innovation. It has merits that seem worthy of our consideration, it has strong points that should make us look with favor upon its adoption, but not, however, before the device has been through the proving ground of practical use under all climatic and mechanical conditions.

Mr. MEREDITH. Mr. Chairman, the program indicates that the next number is a paper prepared by myself. As a matter of fact,

Digitized by Google

this paper is rather a composite composition of the inspectors of my division, men who are practical in every sense of the word and have gained their knowledge and experience in actual contact with devices and conditions which they meet and have to deal with in their work.

TESTING VEHICLE-TANK METERS

By Massachusetts Inspectors of Standards[6]

While this paper is intended to deal specifically with meters installed upon vehicle tanks, much of the subject matter will be found applicable to all delivery systems in which a meter is used as the measuring element in connection with a power-driven pumping unit.

Experience teaches that a meter will record air or vapor as readily as it indicates the volume of liquid which passes through it. It is therefore important that the pipe lines, valves, stuffing box, and connections be air-tight. The suction incident to the pumping process is sufficient to draw a considerable quantity of air through a leak so small that little, if any, gasoline can seep through it.

It is also essential that the opportunity for air pockets be reduced to a minimum by eliminating all unnecessary elbows, angles, or bends in the pipe lines. Where an air pocket exists in the line, the entrapped air expands and contracts alternately as the pump is operated or stopped. As this contraction occurs it causes a suction sufficient to draw air into the line at any point where even the slightest opportunity for leakage exists.

Especially where a power pump is used, the pumping process causes the liquid to "break." In other words, it destroys the cohesion of the liquid particles and introduces bubbles of air or vapor which, unless eliminated, will have their volume recorded as they pass through the meter with the liquid.

In delivery from a vehicle tank, a centrifugal motion is set up as the liquid lowers in the tank, forming a miniature whirlpool in line with the suction pipe. The bottom of this whirlpool is constantly lower than the level of the liquid and eventually becomes lower than the end of the suction pipe so that a considerable quantity of air may be carried along with the liquid.

Gasoline also invariably contains more or less dissolved air which has been introduced by exposure to the atmosphere, or by the pressure of air in a closed container, the amount depending upon the volatility of the gasoline and the conditions under which it is stored. As outlined at the Twenty-second National Conference by Dr. Oscar C. Bridgeman, experimental work at the Bureau of Standards showed that a highly volatile aviation gasoline will dissolve about one-fourth of its own volume of air, while the ordinary motor gasoline will dissolve about one-sixth of its volume when both are put under an air pressure of 14.7 pounds per square inch.

Having shown the various conditions under which gasoline and, to a lesser extent, other fuel oils may become impregnated with air, the next step is to determine the possible effect of this air upon the accuracy of the meter or other measuring device which indicates the purported volume of liquid discharged.

[6] This paper was presented to the conference by Francis Meredith, director of standards, State of Massachusetts.

Digitized by Google

In discharging gasoline or fuel oil from a vehicle tank, through a meter supplied by a power pumping unit, the presence and registration of considerable quantities of air were self-evident. It then became a question as to the extent to which this might also be true when such meters were supplied by gravity flow. To determine this point, a measured quantity of 100 gallons of gasoline was placed in a truck tank having a float control valve installed in the line between the tank and the meter and designed to close as the last of the liquid left the tank and thus exclude air carried along by suction as the tank emptied. Upon this test the meter accurately registered the quantity of liquid discharged.

A similar test made with the same quantity of gasoline, after disconnecting the bleeder pipe from the float-control valve and rendering the latter inoperative by jacking up the valve lift spring, showed an overregistration of approximately 2.7 gallons caused by the registration of air.

Tests of a meter, where a motor-driven pumping unit was used in connection with a vehicle-tank installation, showed excessive and widely varying errors at different times, although an "air separator" was installed between the pump and the meter. The first of these tests, made early in March, involved a 2-compartment tank, the compartments having been calibrated as containing 504 and 503 gallons, respectively. The 504-gallon compartment was filled to capacity with gasoline, which was then pumped through the meter into the second compartment at a constant rate of 47 gallons per minute. The meter showed a purported discharge of 518¾ gallons, an overregistration of 14¾ gallons. The operation was then reversed by pumping the liquid back to the first compartment, the meter upon this test showing an overregistration of 54½ gallons.

Early in August a meter of the same type was tested under what might be termed "ideal conditions." An improved type of air separator was used, and the test was made by a representative of the meter manufacturer. The meter was installed on an underslung platform near the cab on the right-hand side of a 2-compartment tank truck. The pumping unit was located on opposite side of truck and was operated by means of the truck motor. A relief valve was installed close to pumping unit. Between the pump and the meter a hand-controlled valve, a strainer, and an air separator were installed in the order named. Between meter and outlet a back-pressure relief valve helped to preserve a normal pressure. Pipe lines and joints were air-tight, and there was no opportunity for air pockets.

A measured quantity of 502½ gallons of gasoline was placed in one of the tank compartments and then pumped into the empty compartment, the rate of flow being 48 gallons per minute. Upon this test the meter indicated discharge of 502 gallons, an error of only one-half gallon. While the results of this test showed a wonderful degree of accuracy, they were not indicative of what might be found under average conditions of installation and distribution, so a series of tests was subsequently made in order to determine the effect upon the accuracy of meter indications when air or vapor was present in appreciable quantities.

Digitized by Google

Within the next week another test of the same meter was made, furnace oil being used as the testing medium. A compartment containing 502½ gallons was emptied through the meter, the shut-off valve of the adjoining empty compartment being open, and the pumping operation being accelerated as much as possible by gradually advancing the hand throttle of the motor. This acceleration apparently had little effect upon the rate of flow, which ranged from 50 gallons per minute at the start to 47 gallons per minute when 300 gallons had been discharged, and thereafter gradually diminished as the supply decreased. It did, however, materially increase the surging and consequent breaking up of the liquid. At the completion of delivery the meter reading showed an apparent discharge of 605 gallons, an overregistration of 102.5 gallons.

Early in October, additional tests of this identical equipment were made, some adjustments having been made in the meantime by a member of the engineering department of the meter manufacturer. During these tests the shut-off valve of the empty compartment was left open as before. The 502½-gallon compartment was filled and contents metered through 2-inch hose to compartment of another truck tank, the rate of flow being purposely varied during the test. The rate for the first 150 gallons was 36 gallons per minute, for the next 70 gallons, 44 gallons per minute; for the next 100 gallons, 33 gallons per minute; and for the remainder, 36 gallons per minute. Upon this test the meter showed an overregistration of 7 gallons. The 502½-gallon compartment was refilled and contents metered to another tank, the motor being gradually accelerated during operation. The rate of flow for the first 120 gallons being 54 gallons per minute, for the next 100 gallons, 42 gallons per minute; for the next 60 gallons, 40 gallons per minute; for the next 125 gallons, 32 gallons per minute, the rate thereafter not being determined. The meter showed an overregistration of 15 gallons at the conclusion of this test.

In the foregoing tests the acceleration of the motor and the opening of the valves in the empty compartments were designed to produce conditions under which the efficiency of the meter and the air separator could be determined with a maximum amount of air to be eliminated. It appearing quite possible, however, that similar conditions may sometimes be found in everyday practice, a further series of tests was made in November, with an expert service man present to observe results and determine what changes or adjustments might tend to eliminate erroneous registration or reduce errors to a minimum. A known quantity of 769 gallons of furnace oil was metered from a tank compartment into an underground tank, with motor accelerated and valve of empty compartment open, the meter showing an overregistration of 26.9 gallons. The expert then made adjustments of the back pressure and pump-relief valves, the compartment was refilled and test repeated, the overregistration being reduced to 16.6 gallons on this test. A further adjustment of the relief valve only was then made and the test again repeated, the overregistration being reduced to 8.9 gallons. The rate of flow at beginning of first test was 45 gallons per minute. After the first adjustments were made the effect was shown in a reduction of the flow to 43 gallons per minute and after the final adjustment it was 42 gallons per minute.

Digitized by Google

The method of testing, by means of the standard test measures ordinarily employed by weights and measures officials in testing retail metering systems is of little value when applied to a meter used in delivering wholesale quantities from a truck tank. In the latter case the test should include metering from the tank compartment of a considerable predetermined volume of liquid, preferably the full capacity of the compartment. In testing, the following precautions should be observed:

1. See that the compartment to be employed and the pipe line leading therefrom are completely emptied, starting the pump if necessary to insure this empty condition.

2. See that outlet valves are tightly closed; then place a measured volume of liquid in the compartment (not less than 100 gallons in any case).

3. Having taken the meter reading, open the outlet valve of the compartment and start pumping operation, discharging liquid at normal rate of flow through hose, preferably into an empty compartment of the same truck, so as to facilitate a retest with an expenditure of the least amount of extra time and labor. The fill opening at the top of the compartment being uncovered during test, it is easy to observe whether there is an undue agitation causing a breaking of the liquid during the pumping process. There should also be a careful inspection of the entire discharge line in search of possible leaky joints or opportunities for air pockets in the line, as such conditions, if found, may account for errors observed when final meter reading is made upon completion of delivery. The rate of flow should also be determined from time to time, as the test proceeds, and compared with the rates prescribed by the manufacturer for the particular type of meter under test.

4. When a meter is installed upon a gravity flow line, without auxiliary pumping unit, a test similar to that described above should be employed with necessary variations because of the fact that liquid must be discharged into a container placed at a lower level in order that the law of gravity may operate.

5. When meter readings are found to be correct within tolerance, seals should be employed at all points where adjustments are possible which might affect the meter registration.

(At this point Mr. Meredith, first vice president, assumed the chair, succeeding Mr. Jarrett, second vice president.)

DISCUSSION OF ABOVE PAPER

Mr. KELLY. Mr. Chairman, may I ask a question about that paper that you have just presented. I would like to ask what, in your opinion, is the value of testing a tank wagon by means of a meter as compared with a test using a calibrated tank? Which do you consider the more accurate?

The ACTING CHAIRMAN. I think a test with the calibrated tank would be preferable. We are inclined to work toward that.

Digitized by Google

CALIBRATING VEHICLE-TANK COMPARTMENTS BY LIQUID METERS

By H. N. Davis, *Deputy Commissioner of Weights and Measures, State of Vermont*

Mr. Chairman and delegates, doubtless many of you who are officials of weight and measure departments have been asked why vehicle tanks, used as measures for the delivery of petroleum products, were not calibrated to determine their correctness the same as other containers used as measures. It was because this question was so frequently propounded and the demand so insistent that the weights and measures department of Vermont was sponsor of a bill before the legislature of 1929, designed to make it compulsory for the distributors of fuel oil and gasoline to equip their vehicle tanks with meters to determine the amount delivered to each individual customer; the delivery was to be paid for on the basis of the meter reading. This bill was opposed very strenuously by the oil distributors, and a substitute bill was reported out from the ways and means committee requiring distributors of petroleum products to have all tank vehicles used by them calibrated under the supervision of the weights and measures department. This bill was passed and became a law.

A letter in the form of a questionnaire was sent out by our department to each distributor of gas and oil, requiring him to give us information as to the number of vehicle tanks operated in Vermont. the number of compartments in each tank, the truck number, and the State license number of each truck. Specifications and tolerances which apply to vehicle tanks and accessory piping and valves, whenever the tanks or compartments were used as measures, were also sent out. These specifications required an adjustable indicator in the fill opening, which could be sealed at a point which would determine the correct gallonage as stenciled on the outside of the dome of the compartment. Expansion space was allowed for change in volume occasioned by temperature. After experimenting with a 50-gallon measure and bucketing out in 5-gallon test measures we decided on a meter system of calibration, and a meter was purchased for that purpose.

Our method of calibration has been by gravity, using gasoline from the overhead storage tanks of the distributor. The work was done during the winter months when the temperature would not affect the measurement as much as in the hot weather. Before putting the 1½-inch meter into service it was carefully checked with a 50-gallon test measure. Also, 50 gallons of light oil was run through the meter into a vehicle tank and bucketed out with sealed 5-gallon test measures. The inaccuracies in these tests were negligible. The meter was attached to the rear end of an automobile and securely fastened in place, and it remained in this position while calibrating the vehicle tanks. A 10-foot length of 1½-inch hose was attached to the discharge of the distributor's storage tank by means of reducing couplings, to the intake of the meter. Another 10-foot hose was attached to the discharge side of the meter, reaching to the compartment to be calibrated. The flow of the prod-

Digitized by Google

uct through the meter was controlled by a quick-action nozzle valve at the end of the hose on the discharge line of the meter. The nozzle was carried well down in the compartment. Before starting the test for verifying the capacity of the compartment, great care was taken to expel any air that might be in the hose line or meter. Tests were made with a 5-gallon test measure before each compartment was calibrated. When great discrepancies between the distributor's measurement and the meter were found, the contents of the compartment were drawn off and the compartment rechecked. Most of the distributors at first were skeptical about the use of the meter for accurate measurement and had to be shown that it was dependable and even more accurate than bucketing or pin gaging the compartment. The meter was checked against vehicle tanks coming from Massachusetts and New York which had been calibrated, the filling points sealed, and capacities marked, and the discrepancies, varying from 54 to 10 cubic inches in deficiency, were surprisingly small. Several meters installed by distributors at their storage plants, used to check their product from storage to vehicle tanks and from tank cars to storage, were checked and the errors found were very small, except in one instance. We were very well satisfied with our tests and received the cooperation of every distributor doing business in the State. We sometimes had to prove our premise by bucketing out a compartment of water, but were able to maintain our position. An officer of one of the large refining companies came to witness the calibration of their tanks and expressed entire satisfaction with results obtained with the meter. I will give a few examples of the results of tests made.

Report of tank-truck inspections for ———— Oil Co., Burlington, Vt., December 11, 1929

Truck No. 7365:
Front compartment, marked capacity, 408⅜ gallons; calibrated 408.9 gallons.
Rear compartment, marked capacity, 406⅛ gallons; calibrated, 406.6 gallons.
Truck No. 7881:
Front compartment, marked capacity, 441½ gallons; calibrated, 441 gallons.
Rear compartment, marked capacity, 441 gallons; calibrated, 440.9 gallons.
Truck No. 8833:
Front compartment, marked capacity, 444¼ gallons; calibrated, 445 gallons.
Rear compartment, marked capacity, 442¼ gallons; calibrated, 443.6 gallons.
Truck No. 8861:
Front compartment, marked capacity, 442¼ gallons; calibrated, 444.5 gallons.
Rear compartment, marked capacity, 439 gallons; calibrated, 441.2 gallons.
Truck No. 7366:
Front compartment, marked capacity, 408 gallons; calibrated, 407.7 gallons.
Rear compartment, marked capacity, 406 gallons; calibrated, 404.8 gallons.
Truck No. 7911:
Front compartment, marked capacity, 438½ gallons; calibrated, 440.8 gallons.
Rear compartment, marked capacity, 438⅞ gallons; calibrated, 439.5 gallons.
Truck No. 7364:
Front compartment, marked capacity, 408 gallons; calibrated, 409.3 gallons.
Rear compartment, marked capacity, 406 gallons; calibrated, 408 gallons.

Digitized by Google

Truck No. 7896:
Front compartment, marked capacity, 442½ gallons; calibrated, 442.8 gallons.
Rear compartment, marked capacity, 442 gallons; calibrated, 441.5 gallons.
Verified truck No. 8833, rear compartment, and truck No. 8861, front and rear compartments.

HARRY C. MOORE, *Inspector.*

Report of tank-truck inspections of ———— Coal & Fuel Co., Burlington, Vt., December 20, 1929

Truck No. 1:
Compartment No. 1, marked capacity, 305 gallons; calibrated, 302 gallons.
Compartment No. 2, marked capacity, 204 gallons; calibrated, 202 gallons.
Compartment No. 3, marked capacity, 102 gallons; calibrated, 101 gallons.
The capacity as calibrated to points which were recently put in, and which I advised them to fill to, is as follows:
Compartment No. 1, 299 gallons.
Compartment No. 2, 199 gallons.
Compartment No. 3, 99 gallons.
Truck No. 2:
Compartment No. 1, marked capacity, 313 gallons; calibrated, 302 gallons.
Compartment No. 2, marked capacity, 202 gallons; calibrated, 203 gallons.
The capacity as calibrated to points which were recently put in, and which I advised them to fill to, is as follows:
Compartment No. 1, 294 gallons.
Compartment No. 2, 196 gallons.

HARRY C. MOORE, *Inspector.*

One hundred sixty thousand nine hundred and thirty-nine gallons of gasoline and light oil were run through the meter to calibrate 630 compartments, with only one adjustment of the meter. No differences were discovered in meter due to different heads of liquid. Tests will be made in summer with meter to ascertain differences due to temperature effects.

I am not so sure that any great benefit will be derived from this work. The vehicle tank must be in nearly a level position at the place of delivery, and atmospheric conditions must be about right, or the purchaser at the filling station will not be able to determine accurately the amount delivered, by inspection of the sealed filling point at the time of delivery. However, the public feel that their interests have in a measure been safeguarded and that they will benefit by our work.

DISCUSSION OF ABOVE PAPER

Mr. MELIDY. Mr. Chairman, I would like to ask Mr. Davis from Vermont a question. When you seal tank compartments, do you have any trouble with seals broken on reinspection.

Mr. DAVIS. You see our work is of very recent origin so we have no experience on that point.

Mr. MELIDY. In Worcester when we have made a calibration we seal an indicator in the top of the dome. We measure the exact distance of that indicator from the top and write it in our description in the sealer's certificate of the truck. If we have a broken seal, instead of making a retest we consult our records and reset the indicator in the dome. That method saves considerable time.

Mr. DAVIS. That is a very good suggestion and we appreciate it. That will save the necessity of rechecking it.

Mr. PAYNE. One of our New York State sealers advises me that he has a meter for calibrating gasoline vehicle tanks and that with

Digitized by Google

the meter one inspector can calibrate a 1,500-gallon tank with 4 or 5 compartments in about 2 hours. He does not hestitate to say that the meter is more accurate than the old method of drawing it off in 5-gallon measures.

Just last year 45 tank trucks were calibrated, and when several changes were made in ownership the new firms all sent their tank trucks to be calibrated again. In every case the meter was used and the capacity of each compartment was found to be the same as formerly. All of the tanks formerly calibrated with the 5-gallon measure were retested with the result that most compartments were found to vary from 1 to 2 gallons. Considering time, labor, and accuracy, the meter is preferred for that kind of work.

Mr. FOSTER. Mr. President, I would like to ask the gentleman from Worcester how they fix the indicator at the filling point so that there is no question of its moving. How is that accomplished?

Mr. MELIDY. We have the indicator welded to the dome so that there is no question about it.

Mr. SWEENEY. Mr. President, in sealing tank wagons in Boston we have devised a scheme of boring a hole through the indicator, then we put a threaded screw through that with nuts on top and bottom; the screw is perforated and the pressure is against the disk, and it is impossible to knock the seal off. We prefer that to hanging the seal by a wire.

Mr. MELIDY. Mr. President, I understand that all vehicle tanks have an adjustable finger to raise up and down in the dome. If you get this finger or indicator down into the compartment the chance of error in filling is very much increased. In a 12-inch dome a quart will cause a drop of about one-half an inch.

When we have calibrated a tank we tack up in the cab the sealer's certificate giving the date of the test, the number of the tank, and the amount which each compartment holds. The customer can ascertain from this the amounts being delivered.

A MANUFACTURER'S REPRESENTATIVE. Mr. Chairman and gentlemen, I wish to suggest that the compartment is large and the dome small, and if the indicator is not put down into the compartment, in hot weather like to-day the expansion of the gasoline might cause it to spill over the street and result in a fire hazard which, in the last analysis, would be worse than taking a chance on short measure.

The ACTING CHAIRMAN. I quite agree with you; there should always be an adequate expansion dome. Sometimes we notice that the construction of the domes is not always in accord with that idea. Sometimes I believe there are means provided whereby the opportunity is created to take care of expansion in a different fashion.

CALIBRATING VEHICLE TANKS BY LARGE-CAPACITY MEASURES

By S. T. GRIFFITH, *Chief, Division of Weights and Measures, City of Baltimore, Md.*

Mr. President, members of the conference, and visitors, before beginning to describe the method used by the division of weights and measures in Baltimore for calibrating vehicle tanks by large-capacity measures, may I invite your attention briefly to a phase of the dispensing of petroleum products which during the past year

Digitized by Google

has arisen in Baltimore. It seems to fit in here with the discussion we have already had on the use of various meters.

I refer to the sale of fuel oil on the basis of the readings of individual household meters. Some time ago, one of the nationally known oil burner companies proposed to install in Baltimore their oil-burner system in private residences, to which would be attached a meter for the purpose of indicating the amount of fuel oil consumed, and it was their idea to charge the householder only for the amount consumed, as indicated on said meter.

The plan apparently appealed to the public for the reason that they were accustomed to pay for the gas and electricity consumed in their homes by the monthly readings of meters. This company felt that the psychological effect on the consumer would be such as to assure him of a more equitable plan of buying fuel oil; and if the oil meter was tested and approved by the proper municipal authority, it would establish its accuracy and thus eliminate complaints and contentions pertaining to short measure, which now constantly arise at various times under the usual system of delivery of fuel oil in bulk to the individual storage tanks.

This company applied to the division of weights and measures of Baltimore for the testing and sealing of these meters for accuracy. The meter offered for test was of a type widely used throughout the United States for registration of water, but it was realized that to test this meter for oil, it would require a different method from that used for water purposes. We, therefore, requested the chief engineer of Baltimore for permission to secure the necessary equipment, but instead of accomplishing this, the matter was referred to the city law department, who decided that this particular phase of measuring was not contemplated under the statute which empowered our department to test and seal all weighing and measuring instruments used in trade.

It was held that the installation of this meter in a private home did not place it within the purview of public trade. Application was then made by the oil-burner company to the public service commission, who in our city have supervision over gas and electric meters. but they declined to test these devices, probably because of lack of universal use. Nevertheless, while all this correspondence was going on, our office, anticipating that in the final outcome the division of weights and measures might be called upon to make these tests and inspections, proceeded to work out a method, and, with the assistance of Mr. Smith, of the division of weights and measures of the Bureau of Standards, worked out the following plan:

It was intended to hook up these meters in series so as to test 20 or 30 of them simultaneously. The conditions of the test were to simulate, as nearly as possible, the exact conditions that would exist in the individual household, and the tests, therefore, were to be made with the actual fuel oil that was to be consumed. On the small storage tank with a capacity of 77 gallons, a motor was to be attached to pump the oil through the meters arranged in series at the same speed as maintained under actual operation in the home.

The oil would be pumped through one line of meters and returned through the other line of meters into a measuring tank holding 65 gallons, and calibrated in gallons by means of a gage on the outside of the tank. This gage would indicate the quantity passed through

Digitized by Google

the meters, by a float resting upon the surface of the oil within the calibrated tank and operating in a groove up and down the gage on the outside. The meters would be so mounted that any one of them could be removed without disturbing the rest; and readings were intended to be taken over a period of time extending through 24 hours.

The rack on which the meters were to be set up was to be so constructed that the entire body of the two lines of meters could be inverted at will so as to exclude all air which might be trapped in any one of the meters; this would assure a continuous flow of a solid column of oil. This plan of test should have proven highly successful, but unfortunately, through the decision of municipal authorities, we never had a chance to work it out. It was thought, however, that you might be interested in the plan of inspection.

The oil-burner company installed about 60 of these meters in various homes in the city of Baltimore, and furnished our office with a letter listing the locations, but as we were estopped from testing these meters, no investigation was made. Upon receipt of Mr. Holbrook's request that we describe this phase of dispensing petroleum products, inquiry was made with the oil-burner company only to learn that they had temporarily abandoned the project for the reason that the meters used proved entirely unsatisfactory.

The company had gone ahead with the plan, as originally outlined, but found that the meters in nearly every instance registered from 10 to 50 per cent less than the actual quantity of oil consumed, due to the fact that they became gummed or corroded with the deposits of matter contained in the fuel oil. In some instances the meters had ceased registering entirely, with the result that under their contract with the individual householder to pay only for what the meter read each month, they were unable to collect for the actual amount of fuel consumed, although they were able to show the individual that the meter was not registering correctly. Of course, some adjustments were made, but in the end, the oil company lost thousands of gallons due to the fact that the meter used was entirely unsatisfactory, and to-day they have removed every meter and are now dispensing their fuel oil by vehicle tank as the other companies are doing. I have here for your examination one of these meters. The oil-burner company, however, advised that they were still working on the plan with a hope of finding a meter which would be adequate and accurate enough to carry out their original intention of dispensing their fuel oil on the monthly reading of the individual meter.

Now, in regard to calibrating vehicle tanks by large-capacity measures, which is the title of the subject assigned me on our present program, in Baltimore we have found great success with the use of a 100-gallon and a 50-gallon test measure. The division of weights and measures has tried to make use of the many valuable ideas which have been promulgated in the several annual meetings of this conference, and the writer has referred to previous reports for methods to follow. It seems to us, however, that none were susceptible to the accuracy and speed that might be attained with the use of large-capacity measures.

In the past few years, we have tested a number of tank vehicles with the 5-gallon test measure, only to find that this method, while

Digitized by Google

fairly accurate, is slow and tedious. Our first attempt with large-capacity measures was with a 100-gallon test tank alone. With the use of this measure we were enabled to cut down the time of handling a tank vehicle to less than one-third of the time required with the 5-gallon measure. We first used this 100-gallon measure by placing the same above the openings of the different compartments and filling to a certain designated mark, following the specifications for tank vehicles, as previously laid down, which provide for the filling of each compartment with all valves open. We used a small rod which was passed through the manhole cover to each compartment and had a crowfoot bend to register the point in the compartment at which it was calibrated. This marker was sealed through the rod and a castellated lock nut; the lead seal wires were passed through both and secured them permanently. We also attached our usual current-year seal tag, which enables us to determine at a glance that a passing tank vehicle has been calibrated.

The 100-gallon test tank was then removed to a point below the outlets of the compartments and the compartments were emptied through it. This enabled us to make a double check by comparing the results of the two calibrations. This double check naturally slowed up the work considerably, but it gave us a more accurate calibration. We nevertheless ran into the problem of still having to use 5-gallon test measures to complete a compartment, as the capacity was seldom, if ever, found to be in exact multiples of 100 gallons.

We therefore asked several test-measure companies if they would make up a 50-gallon test tank, and one company furnished us with this size of measure also. We then found that with the 50-gallon and the 100-gallon sizes we could calibrate vehicle tanks with much more facility and speed and accuracy.

In one of the city yards in Baltimore a platform was suspended from the steel roof girders of a building sufficiently high to permit any size tank vehicle to drive under it. Upon this we have permanently mounted both the 100-gallon and the 50-gallon test-tank measures.

In the use of these large-capacity measures as furnished by the manufacturer it was found impracticable to fill them to an exact zero reading because of the lack of control of the flow of water, which was used as a testing medium. We devised a plan of inserting a small pet cock in the neck of each measure, so that it is now easy to control the filling of each tank to an exact zero indication. Where before it had been necessary to draw off any excess through the main outlet, which is 2 inches in size, now we can drain through this pet cock very easily and quickly.

Most compartments of vehicle tanks contain a quantity somewhere near the half or even hundred gallon mark. In other words, they usually run in odd quantities of, say, 140, 165, 215, 230, 265, and so on, increasing by multiples of 50 or 100 gallons. We fill both the 100-gallon and the 50-gallon test measures as many times as is required for the approximate capacity of the compartment under test, and then make the final filling with one or two small measures. If a compartment, upon examination, for instance, is found to hold about 295 gallons, the 100-gallon test measure is emptied and two

Digitized by Google

Digitized by Google

Digitized by Google

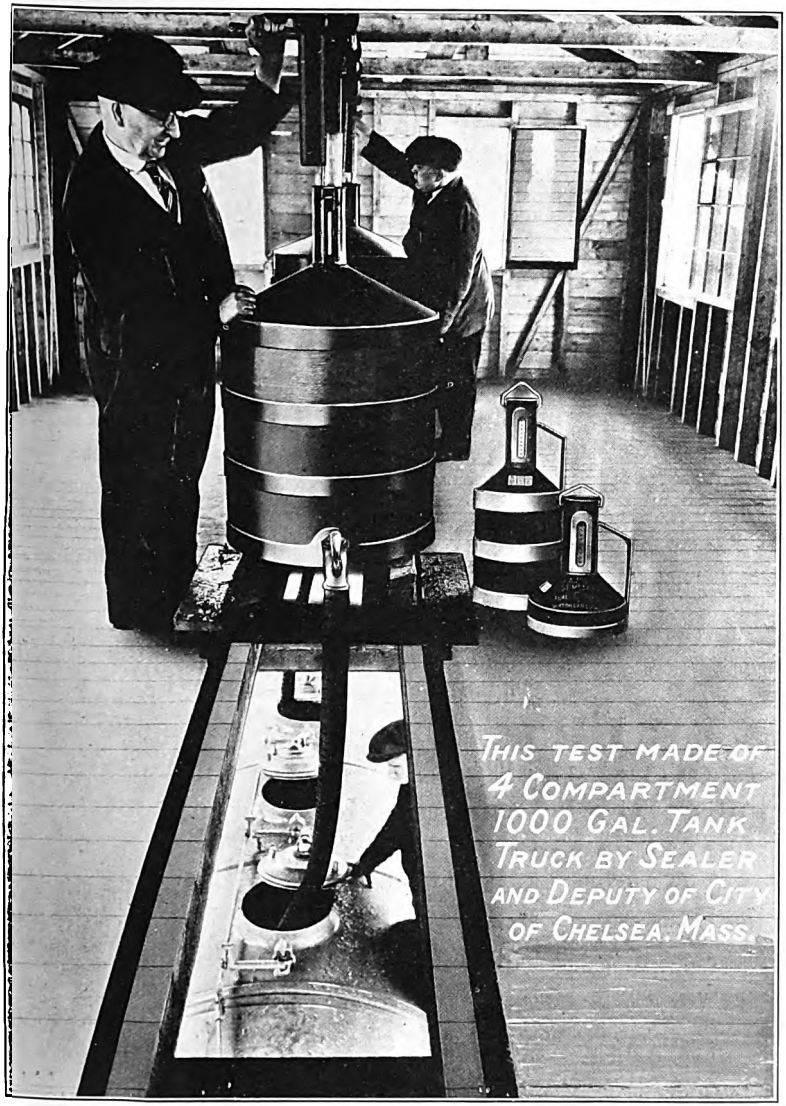


FIGURE 13.—*Calibrating a vehicle tank by means of large-capacity measures, in the city of Chelsea, Mass.*

Digitized by Google

Digitized by Google

full 50-gallon test measures are also emptied; then from the other 100-gallons there are drawn off two 5-gallon measures through a regular hose spigot attached to the side of the 100-gallon measure, and the remainder, or 90 gallons, is emptied in the compartment. Finally it is a very simple matter to ascertain the capacity by utilizing as much of the remaining 10 gallons as is necessary to fill up the compartment to within 1 per cent of its total content. We require this 1 per cent of space below the top of the shell in each compartment for expansion.

We found that it was necessary to require that the lines of the several compartments which had valves, be closed, because a number of surprise inspections made on tank vehicles which had previously been calibrated, demonstrated that they were filled with the valves closed (and the lines empty), although they had been calibrated open and full. It seems that the driver took advantage of this amount by filling the compartments to the indicated marker which we seal, but with all valves closed. Driving up to the delivery point he would show the customer that the tanks were full to said indicator; upon delivery the quantity of each compartment would be short by an amount representing the capacity of the delivery line. In order to obviate this condition, which existed despite the apparent cooperation of the oil companies, our office insists that all valves, if any, be closed, and our calibrations are made accordingly.

With the use of these two large-capacity measures, operated by one inspector of weights and measures and one laborer assistant, we are now enabled to handle from 5,000 to 6,000 gallons per day of seven hours. This may not appear to be very fast as compared with another record to which I have the privilege of inviting your attention; however, this is the first time any calibration has been done in a regular way in the city of Baltimore; and, as it is necessary in most every instance to make permanent markers for the tank vehicle under test, and to bore holes, insert indicating rods, and seal same, we consider it creditable. Of course, in subsequent inspections this element of time will be eliminated and much faster speed can be made.

The sealer of weights and measures in Chelsea, Mass., is using the same method as I have described, varied somewhat only in minor detail. Here the two test tanks of 100 gallons and 50 gallons each are mounted on movable trucks or dollies which slide along an opening directly over the compartments of the tank vehicles under test. The figures furnished me by that official show that the average time to fill both test tanks is 1½ minutes and the average time to drain both test tanks is 1½ minutes, making a total of 3 minutes to handle 150 gallons; the total time for continuous filling and draining a 1,000-gallon tank truck is given at 45 minutes. They are able to make this very speedy time for the reason that they have a 2-inch fill pipe with five outlets to accommodate any position as the test tank is moved along the track.

In our plan both tanks are stationary, and up to date we have been able to utilize only a 1¼-inch fill pipe; the best time we have been able to make in filling and emptying a 100-gallon and 50-gallon measure is five minutes. However, this speed, of course, is dependent entirely upon the size of the fill pipe and the water pressure, and is subject to improvement accordingly.

Digitized by Google

Where a department is limited in funds we feel that we can recommend this system as being very satisfactory under general conditions, and also very economical, as the cost of both the 100-gallon and the 50-gallon can is just a trifle over $100 each. The method which we are using for the calibrating of vehicle tanks by these large-capacity measures has met with the approval of the oil companies operating in our city. While in some instances we have been compelled to reduce the former calibrated quantities which had been ascertained either by the 5-gallon bucket method or with gage sticks, yet in other instances we have increased the quantity because of inaccuracies which naturally developed with the use of these two methods. Several of the oil companies are using meters, but only to a limited extent; they generally confine their use to the measurement from their wholesale storage into the tank vehicle. Naturally the filling stations and consumers are pleased with this work.

If there are any questions pertaining to our method of calibrating which I may have overlooked, I shall be very glad to endeavor to answer them. I thank you.

(During the presentation of this paper Mr. Griffith illustrated by means of lantern slides a number of the measures and installations described.)

CITATION BY WEIGHTS AND MEASURES OFFICIALS OF IMPORTANT COURT DECISIONS IN THEIR JURISDICTIONS

Mr. GRIFFITH. Mr. Chairman, I have a decision I would like to refer to.

In the report made by me at the last meeting of this conference, it was mentioned that in pending litigation involving a milk bottle maufactured to hold only 7 ounces, and used for the sale of a product known as "chocolate milk," the case would probably be heard by the court of the city of Baltimore in time for a report at this session.

I wish to advise that this case was in the nature of an injunction requested by the dairy using these 7-ounce milk bottles, to prevent the city of Baltimore and the division of weights and measures from interfering with its business by prohibiting the use of these 7-ounce milk bottles.

I have here a printed opinion of the Hon. Judge Frank, of the supreme bench of Baltimore, affecting this case, which is too long to read at this time, but, briefly, I may say the decision of the court was as follows:

> That the injunction prayed for would not be granted, but that the bill would be retained in court; if the city of Baltimore was able to produce evidence that this 7-ounce milk bottle was being used for the sale of milk, further intervention by the court would ensue; also that the 7-ounce bottles in question might be continued in use for the sale of "chocolate milk," provided the type used conform with a later model, and the commodity and the contents be clearly indicated and legibly blown in the glass of the bottle.

I wish to comment on this decision by saying that while apparently the city of Baltimore was unable to prevent the use of this 7-ounce milk bottle entirely, yet the expression of the court clearly indicates the sympathy of the bench with the efforts of weights and measures supervision in eliminating the perpetration of fraud in the

Digitized by Google

premises under consideration. The burden of proof, however, imposed upon the city in securing the evidence of actual use of these 7-ounce milk bottles for the sale of milk, is very impractical with the insufficient force of inspectors available—a condition usual with departments of weights and measures throughout the country. Nevertheless, it is hoped that our office may be able to produce such evidence within a reasonable time, during which this bill is being retained sub cura by the court.

ANNOUNCEMENTS

Mr. HOLBROOK. Mr. Chairman, may I make an announcement at this time? At the opening session the secretary was directed to send flowers to William F. Cluett, of Chicago, together with a message from the conference. Flowers have been sent, accompanied by the following message:

The National Conference on Weights and Measures was exceedingly regretful at the opening of its meeting to learn that ill health made it impracticable for you to attend this year. We were at once instructed to advise you that you were sorely missed at the meeting, and the conference sends its warmest regards and best wishes for your speedy recovery.

GEORGE K. BURGESS, *President.*
F. S. HOLBROOK, *Secretary.*
National Conference on Weights and Measures.

I have a wire from H. A. Webster, of New Hampshire, reading as follows:

CONCORD, N. H., *June 3, 1930.*

F. S. HOLBROOK,
Secretary, National Conference on Weights and Measures,
Bureau of Standards, Washington, D. C.

Regret exceedingly circumstances prevent my attending conference. Cordial greetings to the members. Provencher, inspector of Manchester, is only New Hampshire representative this year. Would report that department has maintained its standard of accomplishments, stressing particularly the matter of liquid-measuring devices. Warm regards to you, Doctor Burgess, and Mr. Smith. Renewed assurance of my appreciation of your cooperation.

H. A. WEBSTER,
Commissioner.

(At this point it was moved and seconded that the conference adjourn; the question was taken, and the motion was agreed to.)

(Thereupon, at 4.07 p. m., the conference adjourned to meet at 9.30 o'clock a. m., Friday, June 6, 1930.)

Digitized by Google

SEVENTH SESSION (MORNING OF FRIDAY, JUNE 6, 1930)

The conference reassembled at 9.32 o'clock a. m., at the Washington Hotel, Dr. George K. Burgess, president, in the chair.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON MODIFICATION OF VARIOUS CODES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN

Your Committee on Specifications and Tolerances report for your consideration certain minor amendments in various codes, which appear to the committee to be necessary to be made at this time. The text of these recommendations was placed in your hands several days ago.

First, it is proposed to amend specification No. 7 under the heading "Scales—General Specifications," reading as follows:

7. *When plates or caps are used to limit the longitudinal motion of a knife-edge, the parts of such plates or caps which are liable to come into contact with the knife-edge shall be smooth and at least as hard as the knife-edge. The parts of the knife-edge liable to come into contact with these plates or caps shall be so formed that the friction between them is reduced to a minimum.*

by striking out the present language and substituting in lieu thereof, the following:

7. *All scales shall be so designed and constructed that at all points at which a moving part of the mechanism may come into contact with another part of the mechanism in the course of ordinary usage, frictional effects will be reduced to a minimum through the agency of suitable antifriction elements; opposing surfaces and points shall be properly shaped, finished, and hardened to accomplish the result required.*

The former specification, while intended to provide for antifriction devices, was extremely limited in its requirement. It applied only to devices which were intended to limit the longitudinal motion of the knife-edge, such as plates or caps, and to the parts of the knife-edge liable to come into contact with these. This is not at all a complete specification in relation to antifriction devices, and, therefore, it has been amplified in the manner suggested in order that it may be more general in its application.

The CHAIRMAN. Is it your pleasure that these should be acted on separately? If so, we will consider this item, as read by the secretary. Are there any comments or discussion?

(A motion was made and seconded that the amended specification be adopted, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. It is proposed that under the heading "Scales—General Specifications" a specification be added to be numbered 23c and to read as follows:

23c. All scales shall be of such design, construction, and materials that they may reasonably be expected to withstand ordinary usage without impairment of their accuracy or the correct functioning of their operating or indicating parts.

A specification similar in purport to this is already included in many of our later codes. Upon investigation it was found that it

Digitized by Google

was not included in this earlier code which was adopted in the original instance, I think about 1913. Certainly it is obvious that this specification should be complied with, and we have had some difficulty in purchase specifications on account of its omission. Therefore, it is suggested that it be incorporated in the specifications at the present time.

(A motion was made and seconded that the specification be adopted, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. It is proposed that the first sentence of specification No. 25 under the heading "Scales—General Specifications," reading as follows: "25. All scales shall be maintained in balance," be amended to read as follows:

25. All scales shall be provided with a mechanical device or other means by which the balance condition may be adjusted, and all scales shall be maintained in balance.

While we formerly required that scales should be maintained in balance, we did not require a balancing means, which we think is essential. It is intended that the definitions will remain as they appear in the present specification.

Mr. NEALE. Mr. Chairman, I just wonder if the committee means to say "by which the balance condition may be adjusted"? I think it is a question of means. I do not know whether you can adjust a balance condition. I think you may change a condition and bring about a condition of balance.

Mr. HOLBROOK. It seems to me that you do not adjust the means. I think you manipulate the means in order to secure the condition. Perhaps the word "secured" might be better than "adjusted," or it may be that the word "adjusted" is all right. I would think the adjustment of the condition was to be obtained by the manipulation of the means. The meaning of it is obvious.

The CHAIRMAN. You do not make a formal amendment?

Mr. NEALE. No; I just offered it for the consideration of the committee.

Mr. HOLBROOK. The committee will give it consideration.

The CHAIRMAN. You have heard the proposal on item No. 25.

Mr. MEREDITH. Is the motion on the word "secured" for "adjusted"?

The CHAIRMAN. The gentleman did not offer an amendment, so the question is upon the amendment as proposed by the committee.

(A motion was made and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. It is proposed that specification No. 8, under the heading "Liquid-Measuring Devices," be amended by adding the following words at the end of the third paragraph—

and that in lieu of the maximum rate the words "full flow" or similar and suitable words may be used—

to make this portion of the specification read as follows:

* * * *all such meters shall be legibly marked to show the maximum discharge rates under normal conditions of installation and the minimum discharge rates and the maximum working pressures for which they are intended to be used: Provided, however, That the value of the minimum rate shall not be greater than 7 gallons per minute, and that in lieu of the maximum rate the words "full flow" or similar and suitable words may be used.*

Digitized by Google

It has been urged that when a liquid meter is marked as having a maximum discharge rate of, for instance, 20 gallons per minute, the manufacturer may have produced a device which under certain installation conditions will accurately deliver 20 gallons per minute; yet, in the field, when the installation conditions are somewhat different from those normally encountered, a somewhat less amount may actually be delivered by the meter operating at full flow—16 or 18 gallons per minute, perhaps. Some difficulty has been encountered as a result. The buyer of the device—seeing 20 gallons per minute marked upon the meter—is said sometimes to demand that 20 gallons per minute be realized in his installation, regardless of the conditions encountered. The words now suggested require that the meter be correct at the full flow which can be obtained with the pumping means in use and with the outlet valve wide open. To the committee, it appears that such a statement on the meter is just as satisfactory from a weights and measures standpoint as the "maximum discharge rate" statement in terms of gallons per minute; therefore we recommend the change that has been proposed.

(It was moved and seconded that this amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. There are two additional proposals which were decided upon so late that we did not have the opportunity of including them in the mimeographed copy of this report which was placed in your hands a day or two ago. These amendments are under the heading "Lubricating-Oil Bottles."

Specification No. 2 for Lubricating-Oil Bottles reads as follows:

The over-all heights of bottles of the various capacities shall not be greater than the values shown in the following table:

Capacity of bottle	Maximum height
2 quarts	*12¾ inches.*
1 quart	*10½ inches.*
1 pint	*8¼ inches.*

In specification No. 5, referring to the attached spout, it is provided that if a spout be attached to these lubricating-oil bottles this shall not be over 6 inches in length, measured from the point of contact with the top of the bottle to the tip of the spout.

Very shortly after the adjournment of the conference which adopted these requirements it was found that bottles were being placed upon the market in which the bottle and the spout were integral—where the metal spout was permanently attached to the bottle or the bottle was so shaped as to include a glass spout. It seemed that such a bottle might properly be as tall as the combined heights allowed for the bottle and for the spout when these were separate elements.

In view of the fact that Handbook M85 of the Bureau of Standards was just about to be published, the committee added the following note to the maximum-height requirement, and this was printed in the handbook:

Digitized by Google

COMMITTEE NOTE.—Bottles are now being developed and produced in which the bottle and the spout are integral; for instance, a metal top may be permanently attached to the bottle, or the bottle may be so shaped as to include a glass spout. In such cases it seems that compliance with these specifications will be substantially secured when the over-all height of the bottle and the permanently attached spout, or the over-all height of a bottle blown integral with the spout, does not exceed the height specified in this table, plus 6 inches which is the figure given in specification No. 5 as the allowable length of a detachable spout.

Obviously, that was only an interpretation of the specification by the committee, and we desire at this time to have the conference consider that matter. Therefore the committee is now recommending to the conference that a note be added to specification No. 2 specifying the maximum height of lubricating-oil bottles, as follows:

NOTE.—When the bottle and the spout are integral—as, for instance, when a metal top is permanently attached to the bottle or a bottle is so shaped as to include a glass spout—this specification shall be construed to be complied with when the over-all height of the bottle and the permanently attached spout, or the over-all height of a bottle blown integral with the spout, does not exceed the height specified in this table, plus 6 inches.

As we see it, that simply makes the bottle having a permanently attached spout comply with the same requirement as the bottle to which a 6-inch spout is attached.

(A motion was made and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. The next amendment is made necessary by the amendment which you have just adopted.

In specification No. 4 it is provided that the graduation line shall be placed so that there is at least one-fourth inch between it and the bottom of the metal spout when this is screwed firmly into place. Obviously these metal tops which are permanently attached to the bottle and the glass spouts which are integral with the bottle will not be screwed into place. We, therefore, suggest the insertion of the clause "*or otherwise securely attached*," at the end of the third sentence in specification No. 4, to make the specification read as follows:

4. Bottles shall be provided with a clearly defined graduation line blown or otherwise clearly and permanently marked in or on the bottle, and extending at least halfway around it, which indicates the correct capacity, and with the words "Fill to line" or a similar and suitable inscription clearly and permanently marked in or on the bottle and clearly referable to this graduation line. This line shall in no case be more than 0.10 inch in width and the bottom edge of the line shall define the top of the meniscus of the water which is used in the test of the bottle. This graduation line shall be placed so that it is at least one-fourth inch below the bottom of any metal top when this is firmly screwed into place or otherwise securely attached. The capacity of that portion of the bottle above the bottom of the graduation line shall be at least 3 cubic inches.

(A motion was made and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. That concludes the report.

The CHAIRMAN. The next paper on the program is The Use and Abuse of Person-Weighing Scales, by Carl E. Dartt, president Columbia Scale Co. You will remember that we had a paper last

Digitized by Google

year by Mr. Roberts on Coin-Controlled Person-Weighing Scales. This time we will hear from the manufacturer of such scales.

THE USE AND ABUSE OF PERSON-WEIGHING SCALES

By Carl E. Dartt, *President Columbia Scale Co.*

Mr. Chairman and gentlemen of the conference, at the request of F. S. Holbrook, secretary of the conference, I have prepared a paper on person-weighing scales. I note the title, "The Use and Abuse of Person-Weighing Scales," but in discussing this subject I would like to add one more word, "inaccuracy," as I have heard more about that word than any other since I have been associated with the scale business.

The person-weighing scale, taken as a class and allowing exemption to only two or three out of the dozen of makes and models found on the streets and in stores to-day, has earned for itself a unique distinction among American mechanical devices. It is, in all probability, the only mechanical device which after thirty-odd years of experiment and development is less efficient than when it was introduced. In making this statement, you will understand, I am considering the person weigher as a "scale," and to this assemblage the word "scale" means an instrument for exact weighing.

The old beam scale, penny controlled, which was among the earliest of the weight sellers to make its appearance, was, in the main, honest and accurate and entitled to be classed as a scale in all that the word implies. It did its full duty as a scale, but as a penny getter it was more or less of a failure for the reason that only a small percentage of the public knew how to operate it. To the manufacturer and operators this was a serious drawback, for their concern was chiefly with the pennies, and in the era of development which followed, the penny feature was the one which occupied practically all of the attention of everyone concerned.

One after another a long line of hybrid devices followed each other into the market and in almost all of these the giving of accurate weight had been subordinated to some "catch-penny" feature designed to increase the intake. In fact, the new "penny machine," as it had come to be called, had strayed so far afield from the parent scale family that in some States the departments having to do with the control of weights and measures were uncertain whether or not these hybrid machines came witnin their jurisdiction. So we see that starting with the old beam scale, which was a good weigher but not much of a penny catcher, we progressed to the modern penny weighing machine, which is a real good penny catcher but not much good as a weigher.

For a number of years the penny weighing machine was good-naturedly accepted by the American public as one of the standard jokes. Even the most optimistic of those who filled these machines with pennies did not expect to get their correct weight, but looked on the machine as a sort of an amusement device and got their penny's worth in laughing at its inaccuracies, fortunes, trying to get their penny back, and what have you.

And then gradually the American Nation became weight conscious. The health campaigns of the insurance companies and the life extension institutes and the new system of combating human ills by pre-

Digitized by Google

ventative rather than curative methods, taught the public that weight is of great importance in the scheme of health conservation. Immediately Mr. and Mrs. General Public became interested in their weight and, inasmuch as few homes are equipped with scales, they naturally turned to the penny weighers for their information. Right here the attitude of the public toward the penny scale underwent an abrupt change. People wanted to know their weight and their correct weight. When they failed to get it they began to protest. Complaints went to the sealers and the newspapers about the inaccuracies of scales. In many cities the newspapers sent out reporters to investigate and a flood of publicity unfavorable to the penny scale resulted. It has had its effect and the end is not yet.

* * * * * * *

The person-weighing scale is also sometimes used as a merchandise scale in drug stores, as the druggist may be equipped only with a small scale; if a scale is needed of larger capacity, the druggist naturally turns to his person weigher, and it is, therefore, very essential that the accuracy of the person weigher should compare favorably with other types of merchandise scales.

Very naturally the question arises as to what can really be demanded of the penny scale in the way of accuracy. Also whether or not it is entitled to special leniency from the governing powers by reason of its coming in direct contact with the public—and sometimes a malicious public when the small boy is considered.

That the penny scale has a hard battle to maintain its integrity there is no question, but when a hard battle is in prospect it is folly to send a weakling to the combat. As a consequence would it be too much to demand that any scale which is to be tolerated as a public weigher must be first of all an honest and well-constructed piece of precision machinery capable of indicating exact weight? And starting with such a scale it would be hard to understand why it should be granted a greater variance tolerance than is conceded to the merchandise scale. The ideal arrangement, to my mind, would be to consider that in the life of the person-weighing penny scale there can be only two honest conditions. Either it must be operating and weighing correctly or else, if wrecked by some malicious abuse, not operating at all.

To bring about such a standard in penny weighers, it would seem advisable that all States pass such laws as will bring the person-weighing scale under the same restriction and supervision as the merchandise scale, and to make these laws apply to all these scales in use.

In the State of New Jersey a law was passed in May, 1926, which required all new types of person-weighing scales to be approved by the State department of weights and measures. It is my understanding that any scale which was on the market prior to that date can be operated in the State of New Jersey, providing, of course, that it can be sealed. It would seem to me that if the scales manufactured prior to 1926 do not come up to the present standard, the manufacturers should be given a reasonable time to make the necessary corrections and if they do not do so, they should not have the privilege of selling or operating this type of scale. If such legislation

Digitized by Google

should be passed, it would not be long before the person-weighing scale would be rated as high as other types of scales and the public could get what they are entitled to, and what they should have—accurate weight.

DISCUSSION OF ABOVE PAPER

The CHAIRMAN. Is there any discussion of the paper?

Mr. SCHWARTZ. I might say, Mr. Chairman, for the benefit of the gentleman, that in New Jersey we had a situation that was somewhat similar to the several instances he offered—illustrations as to changes in indicated weight. In Atlantic County and Atlantic City, there are a large number of person-weighing machines. One morning some years ago, in Atlantic City, I started out right after breakfast to make a cursory inspection of some of these scales. From Atlantic Avenue to the Boardwalk my weight increased and decreased from one-half to 4 pounds on different scales. The only satisfaction I got out of it was that sometimes the scale told my fortune. The weights did not seem to jibe at all. So we started a campaign on person-weighing machines, and rounded them up. Where they were not accurate we put placards reading "condemned" in red letters 8 inches high, together with a statement that the scales could not be used until readjusted and repaired. That was pasted over the face of the scale so that it gave the public warning that that scale was out of order. It did not take long before the person-weighing machine companies had their mechanics along the line, but the placards could not be removed until after we had tested and passed on the scales. And of course that took some time. They had to use a pail of hot water, a scraper, and a brush to get the sign off the scales. Finally we passed that regulation that Mr. Dartt mentioned in his paper. We gave particular attention to those scales and practically made them come up as near as possible to the commodity-weighing machine.

One thing that caused a lot of difficulty was that people did not take into consideration the importance of a person-weighing machine. We had complaints from physicians who had patients with tuberculosis who were taking treatment. Such a patient would weigh himself on a person-weighing machine and find his weight to be 130 pounds, for instance. Then later another would register 128 pounds. Now, an increase in weight is all right, but when a scale gave a weight lower than he had formerly received he would feel that he had lost weight, with the result that that would retard his recovery, and he would not get along as well as he should have. It was a nervous strain on the patient, and he would get downhearted at the thought that he was not gaining as he should. That is one of the most serious objections to the person-weighing machine.

LOG RULES

By A. W. CORWIN, *Sealer of Weights and Measures, County of Allegany, N. Y.*

Mr. President and gentlemen of the conference, in the sale of saw logs it is often desirable to sell the logs by board-foot measurement before the logs are sawed into lumber. The board foot is the common

Digitized by Google

unit of measurement of lumber and represents a section of board 1 foot square by 1 inch thick. For this purpose a scale or rule is used, called a log rule. By measuring the diameter and length and making proper allowance for defects, the number of board feet in the log is determined, and by this measurement payment is made. This system is also used for estimating the quantity of standing timber.

Fortunately there are at the present time a number of reliable authorities on this subject, and most of the information given in this paper will be quoted from them. If one had the mathematical inclination and the time, it would, no doubt, be interesting to delve into the mysteries of log-rule construction, whether by formula, by chart, or by mill tally. This, however, is not essential. The important feature is whether the rule in question actually shows the content of the log and is fair to both the seller and the buyer.

In sections where lumbering is carried on, the weights and measures official is often called upon to scale logs and to settle disputes arising over the measurement, or "scaling" as it is usually called. This trouble has often been found to be caused by log rules that show widely different readings, the seller using one and the buyer another. This is not surprising when it is considered that there are at least 57 varieties of the log rule in this country, every one showing a different result. Certainly here is a good opportunity for standardization. Of all these different rules the one most inaccurate, the most unfair to the seller of the smaller logs (which constitute most of the logs sold to-day), is the rule in most common use in the State of New York, known as the Doyle log rule. This statement applies as well to many other States where inaccurate log rules are in use, and in a number the Doyle is even fixed by law as the State standard. In contrast to this, several States, especially where lumbering is more extensively carried on, have in use very accurate rules, many of which have been adopted as part of the State law. In referring to the Doyle rule it is intended to include, in a general way, other inaccurate rules to whatever extent the inaccuracy exists.

In an effort to correct the unfairness in the use of log rules in New York State the legislature has recently enacted a law which will be in effect July 1, 1930, fixing the "International ¼-inch kerf log rule" as the standard of that State.

Comparison of some of the more common log rules

Log rule	Log 12 feet long, 12 inches in diameter	Log 16 feet long, 8 inches in diameter
	Board feet	*Board feet*
Maine or Holland	78	44
Vermont State	72	----------
International	70	40
Wisconsin State	60	30
Scribner	59	25
Doyle	48	16

Digitized by Google

Comparison of mill scale, Vermont rule, and Doyle rule

[Furnished by the department of weights and measures, State of Vermont]

Diameter, top end (inches)	Total number of logs	Total by mill scale	Total by Vermont rule	Total by Doyle rule
		Board feet	*Board feet*	*Board feet*
6	14	340	260	42
8	25	989	527	197
10	23	1,270	1,198	645
12	12	1,034	906	600

NOTE.—The mill scale is the amount of lumber made when the log is sawed.

A careful test, under direction of the courts in Texas where logs of given sizes were actually sawed ("Extending a Log Rule," E. A. Braniff, Forestry Quarterly, Vol. VI, 1908, p. 47), showed that for 24-foot logs sawed by circular saw, the Doyle rule gave an overrun for different diameters, as shown below:

Overrun, Doyle rule, Texas

Diameter at small end (inches)	Actual output of sawed product	Scale, Doyle rule	Overrun
	Board feet	*Board feet*	*Per cent*
6 to 6¾	35	6	483
7 to 7¾	49	14	250
8 to 8¾	61	24	150
9 to 9¾	76	37	105
10 to 10¾	95	54	76
11 to 11¾	112	74	51

NOTE.—Overrun is the amount of lumber actually sawed out of the log in excess of the amount determined by log-rule scale.

From mill tests of pine logs sawed with $\frac{3}{16}$-inch kerf, the per cent of overrun was as follows, for 12-foot logs:

Overrun, Doyle rule, Ontario

["Forest Mensuration," H. H. Chapman, M. F.

Diameter of log at small end (inches)	Actual output of inch lumber	Scale, Doyle rule	Overrun
	Board feet	*Board feet*	*Per cent*
6	14	3	366
8	30	12	150
10	50	27	85
12	76	48	58
14	108	75	44
16	144	108	33

Digitized by Google

Comparison of Doyle and International log rules

Diameter of log at small end (inches)	Length of log, 16 feet	
	International ¼-inch rule	Doyle rule
	Board feet	*Board feet*
6	20	4
7	30	9
8	40	16
9	50	25
10	65	36
11	80	49
12	95	64
13	115	81
14	135	100
15	160	121
16	180	144

The method of sawing logs has been radically changing through the years. The logs are of a much smaller size than formerly, and more care is used to save all of the lumber. An investigation in the Province of Ontario, Canada, in 1904, showed that the diameter of the average log sawed at that time was 12 inches, and that it had decreased 63 per cent in 25 years. The Doyle rule never was an accurate rule, but under the old custom of sawing, and with large logs, it might have been tolerable.

H. C. Belyea, professor of forest engineering, Syracuse University, writes:

The Doyle rule is regarded as one of the most inaccurate rules in existence, although it has a rather wide use. It is a rule which, as we say, has a very large overrun with small diameter logs. * * * It is regarded as an extremely good log rule to buy with, but a poor one to sell by, which explains its general use.

Reading from Forest Mensuration, by H. H. Chapman, M. F., of the Yale School of Forestry:

The wide use of this rule [Doyle] has caused losses of millions of dollars to owners selling logs and standing timber, by improper and defective measurement of contents.

The seller can defend himself against the use of a short measure if the latter is consistent and its per cent of error known. But with a log rule like the Doyle, the per cent of error differs with every scale of logs or stand of timber and it is practically impossible to determine the actual loss without remeasuring the logs by a correct log rule or tallying the sawed contents.

When the average log ran between 18 and 31 inches, the defects of this rule were not so apparent, and the overrun was not excessive. But as the size of the logs cut grows less with the advent of second growth and closer utilization, the rule becomes impossible. Its continued use in many regions is due largely to the fact that logs are not often bought and sold, but the timber is purchased on the stump and the owner is unaware of his losses. This rule must eventually be superseded either by a more consistent standard or by the rejection of board-foot measure altogether. No owner of small logs or of young standing timber can afford to sell on the basis of a scale or estimate made by the Doyle rule. As it stands, this rule is a serious obstacle to the profitable marketing of second-growth timber, hence to the practice of forestry.

As a rule for universal adoption the Doyle must be rejected because of its glaring inconsistencies and the Doyle-Scribner because it combines the worst features of both rules.

Digitized by Google

It is surprising that such inaccurate log rules should be found in such general use in this age of speed, accuracy, and standardization. There are, however, some reasons for this. In the first place the buyer usually selects the rule to be used and naturally picks the rule that shows the smallest readings. The Doyle rule is a very simple rule. Simply subtract 4 from the small diameter, in inches, square one-quarter of the remainder, multiply by the length in feet and you have the board feet according to Doyle. Another reason is that it was published in Scribner's Log and Lumber Book which had a large circulation, was widely accepted as a standard, and was almost the only publication on log rules.

The question might naturally be asked, why should the International be adopted in preference to any one of the other good rules now in use? The International ¼-inch kerf log rule is a comparatively new rule, developed in 1917 by Judson F. Clark from his International ⅛-inch rule produced in 1900. The ⅛-inch rule would be open to objection for general adoption, as it would overscale the product of most small mills. This rule is considered by authorities to be one of the most accurate log rules, being formed from a scientific formula which is accurate for all sizes and lengths of logs and checks very closely with the actual mill tallies. It does not make the largest scale of any rule, as you have seen by the tables, but is fair to both the buyer and seller. The Federal Land Bank of Springfield, Mass., after an investigation of practically all log rules, found the International by far the most accurate and adopted it for their work covering several States, including New York.

Reading again from Professor Chapman's Forest Mensuration:

* * * The International ¼-inch rule is probably as perfect a rule as will ever be required in commerce. This rule is especially valuable for logs below 12 inches and above 28 inches, in which classes the Scribner rule is defective. There is nothing to be gained by further efforts to construct new perfect log rules.

Professor Belyea, of the Syracuse State School of Forestry, wrote:

It will be very desirable to have a standard rule adopted in this State * * *. It would certainly be in the interest of the small timber owner who has timber to sell and needs to get every dollar that he can for the value of his timber, and it would certainly be to his interest to have a standard log rule * * *. I am absolutely persuaded the International rule is the best for use in this State.

When it was first proposed to adopt by law a standard log rule for use in New York State we were informed that it could not be done because the powerful lumber interests would easily prevent its passage. There was some opposition but the fact of the matter was that no man had nerve enough to stand on the floor of the legislature or in the committee room and defend a thing so grossly unfair as the log rules now in use.

The matter was presented to the New York State Farm Bureau Federation, attention being called to the fact that there are 4,000,000 acres of farm wood lot in the State, the logs from which constitute an important source of revenue. It was recognized that this was in harmony with the popular theme of farm relief, going it one better by giving to the farmers what they were justly entitled to in the measurement of the wood-lot products. In addition to the Farm Bureau Federation, the bill had the support of the American Agri-

Digitized by Google

culturist and other farm papers, the Federal Land Bank, the State School of Forestry, the State department of agriculture and markets, and others.

The 1929 legislature first passed the bill, but it was vetoed by the governor because the rule was referred to by name and the formula or chart giving the readings was not included. This change was made, and the bill was repassed by the 1930 legislature and signed by Governor Roosevelt.

This section of the law is as follows:

State of New York, agriculture and market laws, in effect July 1, 1930.

SEC. 193c. STANDARD LOG RULE.—The International log rule, based upon ¼-inch kerf, as expressed in the formula $[(D^2 \times 0.22) - 0.71D] \times 0.904762$ for 4-foot sections (D represents top diameter of log in inches; taper allowance, one-half inch per 4 feet lineal), is hereby adopted as the standard log rule for determining the board-foot content of saw logs, and all contracts hereafter entered into for the purchase and sale of saw logs shall be deemed to be made on the basis of such standard rule, unless some other method of measurement is specifically agreed upon.

(During the presentation of this paper Mr. Corwin illustrated by means of lantern slides a number of the matters discussed.)

MOTION IN RELATION TO SPECIAL EXPENDITURE

Mr. MARONEY. Mr. President, may I interrupt the proceedings for just a moment?

The CHAIRMAN. You may, sir.

Mr. MARONEY. Mr. President, I move you, sir, that our president and secretary be authorized, if conditions require it, to draw on our treasury in an amount up to the sum of $500.

(The motion was seconded.)

The CHAIRMAN. You have heard the motion put. Is there any discussion?

Mr. MARONEY. Our reason for bringing this motion before you is known to most of you, and I think it would be preferable not to bring in the details and have them go on our record. I know you all have confidence in our executive officers. I know that whatever they do will be what we expect them to do. In view of the fact that certain conditions exist, I hope there will be no discussion on the matter.

The CHAIRMAN. I would like to say that it might be well to include the vice presidents in the authorizing authority.

Mr. MARONEY. As the vice presidents are miles apart, and, as I said before, you have our confidence, I do not think it necessary. You know, and most of us know, it may be necessary to take action, and quick action; therefore, I limited it to the president and secretary.

Mr. GRIFFITH. I think your suggestion is well taken, but even though distance would not permit of immediate contact, I am quite sure we have the same confidence in our vice presidents as to the action they would take were they included; that will show that all of the officers of this conference are back of the proposition. I ask the mover to accept that amendment.

The CHAIRMAN. The question is on the motion, as you have heard it, as amended. Are you ready for the motion as amended?

(The question was taken, and the motion was agreed to.)

Mr. MARONEY. Thank you, sir.

Digitized by Google

SIDE-BEAM AND HIDDEN-WEIGHT SCALES

By J. C. TINKEY, *Deputy Sealer of Weights and Measures, State of Ohio*

Mr. Chairman, ladies, and gentlemen of the conference, it so happens that I am the only deputy State sealer in Ohio at the present time and there never were more than two. However, we have 88 county sealers and 15 city sealers; with the deputies attached to some of the departments, that gives us a force of about 210 weights and measures officials. In addition, we have commissioners in all of our counties, and their attorneys. Taken as a whole, we have about 725 persons in Ohio directly responsible for the enforcement of the weights and measures law.

This is preliminary to my paper and I hope you will keep it in mind as it shows you how we are organized and how quickly we can put across any new and reasonable regulation.

It is with considerable reluctance that I read this paper. First, because it was requested that our chief, O. J. Bailey, prepare the paper, but when the change was made May 1, placing weights and measures under the division of feeds and fertilizers, we had a new chief, Dr. D. M. Odaffer, who recently requested me to prepare the paper; consequently my time was limited to do justice to such a vital subject.

Second, I had previously informed Mr. Bailey that to change a long-established custom and eliminate scales that could, when in proper order, do correct weighing, was not quite the right thing to do, and if the conference desires to attempt the complete elimination in the near future of this type of scale, I am frank to say that I will not be a party to such an arrangement.

Third, I am more reluctant because there is a vital need of better control of such devices when used in weighing to the customer, and I am fearful that with its many angles for discussion I will not be able to make my points clear in the short time allotted. However, if it will place the matter before you in a way that will court your serious attention and bring it before the conference committee, I will feel that I have at least done my duty, whatever the outcome may be.

I have read what transpired upon this subject at the twenty-second conference and am in accord with the views put forth, but it showed me that it is a very serious debatable question. I have learned that Illinois, Indiana, Michigan, and Minnesota have discussed this question at their conferences, so it is not a new matter.

Ohio laws and specifications are such that the matter could be controlled without any action of this conference. However, we have gone as far as we care to go until we know just what, if anything, this conference will do, as we desire to comply as nearly as possible with your wishes, and believe in standardization and uniformity. It is our belief that with the full cooperation of the manufacturers, dealers, and sealers splendid results will be secured. However, unless a definite date be set for compliance, and unless certain further instructions to sealers be agreed upon and be uniform over the United States, we can not hope for the best results.

Digitized by Google

On September 20, 1929, circular No. 3 was mailed from the Ohio State department, addressed to pump, oil, scale, and grocery companies, and to sealers. The third and fourth paragraphs read as follows:

We wish particularly to call the attention of scale manufacturers and merchants to the requirements of Book 10, pages 7, 28 to 32, 91 to 94, 114 to 118. These are not new laws or regulations as they were adopted by the department more than six years ago. However, a condition has arisen within the past two years which makes enforcement necessary.

The above references refer to scales of the type under discussion.

If scale and pump manufacturers would place with the dealers only those scales and pumps which comply with the State specifications, and if dealers, on the other hand, would use only those that are allowed in the manner designated by the sealers, and replace obsolete equipment as soon as possible with equipment that does comply, conditions would be much better and everyone more nearly satisfied.

At the annual Ohio sealers' convention, held last December, a resolution was passed, requesting the State sealer to make further regulations necessary to handle this scale situation and set a date of compliance. On January 20, 1930, a circular was ready for distribution, but was withheld because we then learned that the matter would be brought up again at Washington, and we desired to comply with the further wishes of this conference. However, in order to acquaint you with the thoughts we had in mind so that you may have the benefit of any points of special interest, and to show you how the whole matter now stands in Ohio, we are concluding our paper by giving you the full text of the proposed circular as follows:

COLUMBUS, OHIO, *January 20, 1930.*

Circular No. —.

To Scale Manufacturers, Dealers, and Sealers:

GENTLEMEN: In our circular No. 3 of September 20, 1929, paragraphs 3 and 4, we called to your attention certain requirements that were to be enforced. To be more specific, one of the things to be corrected is the use of scales not properly constructed or marked and with beams or added weights that are not in view of the customer; therefore in violation of section 7965–1, page 7, book 10; specifications 2, page 91; 24, page 94; 8 and 10, page 114; and general instructions, pages 170 and 176.

In addition to the above laws and regulations, and in order to expedite matters so that uniformity of enforcement will be accomplished, the following rules and regulations are adopted:

No. 1. On and after July 1, 1930, counter scales shall be set on a solid counter, with the reading of the weight of the commodity within 3 feet from the front of the counter, and at a clear angle of vision to the weigher and the customer.

NOTE.—Scales setting crosswise on end of counter may meet the above requirement.

No. 2. Counter scales in use previous to above date will be considered old scales and classed as A and B.

Class A are scales with hidden or added weights used when weighing more than 10 pounds.

Class B are scales with hidden or added weights used when weighing less than 10 pounds.

No. 3. Class A scales shall meet requirements of class B by July 1, 1930, and No. 1 by January 1, 1931.

Class B scales shall meet requirements of No. 1 by July 1, 1930, and previous thereto may be set crosswise of counter at any suitable place provided they are securely fastened to the counter.

Digitized by Google

No. 4. Suspension or any other type of scale, when used for weighing to the customer, shall meet the specifications applicable thereto and be governed as class B.

EXPLANATION.—"Counter scale" means any scale used upon a counter when weighing in the presence of the customer.
"Counter" means any suitable place of installation where scale is intended to be used for weighing to the customer.

Very truly yours,

PERRY L. GREEN,
Director of Agriculture and State Sealer.
O. J. BAILEY,
Chief of Division.

J. C. TINKEY,
Deputy State Sealer.

You will especially note that we did not have in mind to entirely eliminate this type of scale, but to try to secure the cooperation of the manufacturers and dealers to the end that by January 1, 1931, no scale of this type would be used when weighing to the customer except when located in the proper manner. We have explained to the dealers that it is certainly unfair to their employees, as well as to their customers, to use a scale that slows up the work of selling merchandise accurately in not providing the proper view of the transaction to both the buyer and seller. We are ready to proceed along this line, submitted for your consideration, unless you can show us a better way. I thank you.

STANDARDIZATION ACTIVITIES OF THE NATIONAL SCALE MEN'S ASSOCIATION

By M. J. J. HARRISON, *Chairman Committee on Specifications, National Scale Men's Association*

Last year, through the medium of a paper presented at the twenty-second meeting of this organization, the attention of the National Conference on Weights and Measures was, I believe for the first time, formally called to the activities of the National Scale Men's Association. At that meeting the conference was told of the preparation and adoption by the association of a code of specifications for the repair of heavy-capacity scales, and the conference took formal cognizance of the matter to the extent of adopting a resolution expressing commendation and extending cooperation and moral support.

It is now my privilege to acquaint you with some of the further activities of the National Scale Men's Association, and especially to tell you of certain of the association's outstanding accomplishments during the past year.

In the first place, the code of specifications just referred to, for repair of heavy-capacity scales, was slightly revised. I do not want to take the time of this meeting with details, but those of you who are interested may refer to the February and May, 1930, issues of the Scale Journal for a complete list of revisions and the substance thereof.

Of the items of new work, I think possibly the first to be mentioned here is the preparation and indorsement of a code of specifications for light industrial-service track scales.

As you gentlemen are already aware, there are several thousand track scales in present service in the United States. A goodly number of these are owned and operated by railways, and are used pri-

Digitized by Google

marily for determining weights for the purpose of assessing transportation charges. The remainder, and incidentally the larger number, are owned and operated by individual shippers and receivers of carload freight. These are used primarily for determining weights of commodities bought and sold, and such weights are principally used as a basis for settlement between buyer and seller, and also, under certain conditions, for determining transportation charges.

There is no essential difference in the accuracy required in a track scale by reason of its ownership or principal use, with the exception, however, that scales used for weighing grain are, as a trade requirement, somewhat more accurate than other scales are required to be. On the other hand, there are several track-scale sizes and capacities which, for the past 10 years, have been recognized as being standard. These sizes and capacities were agreed to in 1920 by a joint committee representing several interests, and since that time the manufacturers of scales have very largely confined their output of 4-section track scales to those sizes and capacities.

When the code of specifications just referred to, generally identified as "Bureau of Standards Circular No. 83," was promulgated, it was the thought of the joint committee that, notwithstanding the fact that the specifications described a series of scales designed primarily for railway service, they would be acceptable to the industries also. That the committee's view was at least partially correct is apparently proved by the general adherence to the specifications by the railways for new installations, and by the large number of "specification scales" purchased and installed by industries since 1920.

However, there are many shippers of carload freight in the United States who never handle their materials in larger quantities than would be contained in a conventional 100,000-pound capacity freight car. In fact, in many cases, even so large a car as one of 100,000 pounds capacity would rarely, if ever, be seen. The specifications contained in Circular No. 83 contemplated as a minimum a somewhat heavier loading than this, and, for this reason, it began to be urged that a lighter-type scale would be economically advantageous.

Now, of course, as long as the industry had no scale to start with, and simply took the position of declining to pay out the amount of money that a standard scale would cost, the National Scale Men's Association had absolutely no interest in the matter. The association certainly was not in the business of selling scales and had nothing to gain or lose, one way or the other.

However, in many cases the shipper already had a track scale in operation. It might be obsolete—it might be sadly deficient—it might be entirely inadequate for the service to which it was subjected—it might have the habit of breaking down so often as to make it a nuisance. But it might have a nicely polished and impressive weighbeam, and to the owner it was his scale. Any suggestion or recommendation that he throw it on the junk pile and spend several thousand dollars for a new scale might be as welcome to his ears as the whir of a rattlesnake's alarm, and the inspector who had the temerity to advance such a suggestion might find the business end of the rattlesnake pointed his way. In short, the practical

Digitized by Google

result was the perpetuation of a large number of obsolete and woefully inadequate track scales, and to a serious extent this was hindering the efforts of those who were trying to maintain a satisfactory degree of weighing efficiency.

This, then, was a situation in which the National Scale Men's Association could not help but be vitally interested, and in 1929 the association adopted a resolution which, boiled down, favored the admission to standardization of additional sizes of track scales. The publication of this action resulted in considerable impetus being given to the proposition of preparing formal specifications for a lighter-type track scale, and a joint committee was formed under the sponsorship of the association. The committee prepared a code of Specifications for the Manufacture and Installation of Railway Track Scales for Light Industrial Service, which was indorsed by the association at its 1930 convention, and subsequently indorsed by the engineering division of the American Railway Association and accepted by the manufacturers.

Briefly, the new code adds one item to the series of standard track scales. The specifications were printed in full in the February, 1930, issue of the Scale Journal, and describe a smaller and lighter scale than any contemplated by Circular No. 83—a scale designed to weigh a loaded 100,000-pound capacity freight car of conventional length as a maximum load. By reason of reduction in size and strength the total cost of such a scale, installed complete, is expected to be materially less than the total cost of any Circular No. 83 scale. At the same time it is believed that no characteristic essential to correctness of weights for the service contemplated was sacrificed.

For the purpose of discouraging the purchase of this scale by those who might be attracted by low first cost, regardless of other important considerations, the weighbeam capacity was kept consistent with the supporting strength of the structure and the length of scale was made considerably shorter than the minimum Circular No. 83 length.

What the effect of the introduction of this scale will be remains to be seen. The facts that less than three months have elapsed since the specifications were adopted and that business conditions have been very quiet during that time have resulted in fewer sales than might reasonably be expected during a corresponding period, say, a year from now. The committee believed it had the correct answer to its problem, and time alone will prove whether it was right or wrong.

The second accomplishment of the association at its 1930 convention to be mentioned here was the adoption of a code of specifications for test-weight cars for use in testing track scales. These specifications were prepared by a committee of the association and appear in full in the March, 1930, issue of the Scale Journal.

Test-weight cars have existed for many years in one form and another, and for several years it might well be said that they were in a state of development. There had been no particularly definite guide in their design until about 1917, when the American Railway Association promulgated as a part of a general code of rules two paragraphs which outlined certain fundamental requirements. An example of the application of these two paragraphs is seen in the

Digitized by Google

Digitized by Google

Digitized by Google

cars operated by the Bureau of Standards. (See fig. 14.) The requirements were:

1. All metal construction. This is obvious in the view shown.

2. Length of wheelbase not to exceed 7 feet. This is taken as the maximum length of wheelbase which can be used satisfactorily in the testing of 4-section track scales. Since car builders always try to get as long a wheelbase as they can, we actually find that 7 feet has come to be the standard length.

3. Load distributed uniformly on wheels. A fairly obvious requirement.

4. No unnecessary ledges or projections likely to catch and hold dirt. Note how this requirement is followed out in the bureau's car, with its smooth surfaces.

5. No unnecessary parts. The car shown is essentially a mass of cast iron on wheels, and the additional parts are merely those which are required by railway operating rules.

6. Strength and durability. The most cursory glance at the car shown gives the impression of ruggedness, and a more detailed inspection would confirm that impression.

7. Surface area reduced as much as possible. Note how compact the bureau's car seems. There is no surplus area.

8. Accessibility of all parts for inspection. A warning to the designer not to hide anything that should be out in sight.

9. Roller or ball bearings, preferably the former. The bureau's car is equipped with roller bearings, and, as a matter of fact, there have been very few test cars built with ball bearings. A properly designed roller or ball bearing aids materially in the use of the cars in the test of a scale, and has the further advantage of helping to keep the weight of the car more constant than would be possible with ordinary journal bearings.

I am very glad to be able to show at this time another view (fig. 15), which I feel is particularly appropriate for display at this meeting. This view shows the exterior of the Bureau of Standards Master Scale Depot at Clearing, Ill., just outside the city limits of Chicago. The two test cars seen have just been calibrated on the bureau's plate fulcrum master scale, and are being cleaned and greased before being finally weighed and sent out again. These particular cars happen to be of Pennsylvania Railroad ownership.

In addition to housing the bureau's plate fulcrum master scale, this building contains the laboratory and offices of that section of the bureau which has to do with the testing of large-capacity scales. The depot is also the headquarters of the bureau's three track and master scale testing equipments.

It must be remembered that a test-weight car is actually and essentially a test weight. It is the only form of weight standard that can be used satisfactorily in the testing of commercial track scales. It must weight at least 30,000 pounds, and preferably 40,000 pounds, and it may weigh as much as 100,000 pounds. It must be so designed as to vary as little as possible from its nominal weight during the periods that necessarily intervene between calibrations on a master scale. It must be out in all kinds of weather. It must be hauled around the country on the ends of freight trains and must be shunted through yards. In short, it is necessarily subjected to abuse such as you gen-

Digitized by Google

tlemen would never consider permitting in the case of test weights used in the testing of types of scales with which you ordinarily have to deal. And in spite of all this, a test car is essentially a test weight, and the only practical means of insuring the accuracy necessary in the 9,000 or more track scales in the United States.

During the past few years, as the performance characteristics of different types of test-weight cars have become available for comparison, there has been a growing conviction that some distinction should be made as between satisfactory and other types. In other words, it was felt that the general requirements mentioned a few moments ago were all right in themselves but did not go into sufficient detail. It was felt that some organization might well go on record with a detailed description of a satisfactory standard test-weight car—in other words, prepare a detailed code of specifications for such cars. As the organization most interested, it was suggested to the National Scale Men's Association that it might well initiate this work, and the result was the preparation and adoption of the specifications referred to.

The National Scale Men's Association naturally based its specifications on the fundamental conception of a test-weight car as a portable test weight—an instrument entitled to the consideration becoming to formal standards of mass. It was felt that it would be much better to base a code of specifications on this conception and later amend them, if necessary, to conform to the views of practical car designers than it would be to ask the car designers to write a code of specifications and then try to amend that code so as to make it describe a formal standard of mass.

At the present time these specifications have the status of having been adopted only by the National Scale Men's Association. It appears likely that before the specifications attain the desired standing they will also have to be approved by both the engineering and mechanical divisions of the American Railway Association, and steps are now being taken to secure that approval.

The third accomplishment of the National Scale Men's Association at its 1930 convention, and the last to be mentioned here, was the adoption of a standard form for reporting track-scale tests. This form is reproduced in the February, 1930, issue of the Scale Journal. It is the first effort of its kind on the part of the National Scale Men's Association, and sufficient time has not yet elapsed to determine how universal the application of the form is likely to be or whether any changes are likely to be made in it.

In concluding these remarks, I would like to impress on this conference the fact that the National Scale Men's Association exists as a technical organization, interested exclusively in but one of the matters in which you are interested, and from a somewhat different angle, but carrying its activities in that field a great deal further than would be possible or practicable for the conference. The association will welcome and appreciate the counsel and assistance of the conference in all matters of common interest, and takes this opportunity of again assuring the conference of the sincerity of the association in working toward a successful culmination of mutual lines of effort.

Digitized by Google

REPORT OF COMMITTEE ON UNIFORMITY IN WEIGHTS AND MEASURES REQUIREMENTS [7]

Mr. Chairman and members of the conference, we, your committee appointed to consider ways and means for bringing about a more general uniformity in weights and measures regulations and requirements, recommend:

1. That members of the conference continue consideration of the recommendations printed on page 116 of the Report of the Twenty-Second National Conference on Weights and Measures.

2. That investigation as to further ways and means of bringing about uniformity in weights and measures regulations and requirements be continued by sending out questionnaires to members of this association in order to make a full report to the conference next year.

(Signed) J. H. Meek, *Chairman*,
V. A. Stovall,
P. D. Dukesherer,
Philip T. Pilon,
Albert B. Smith,
C. P. Smith,
Committee on Uniformity in Weights, and Measures Requirements.

Mr. Holbrook. This report is signed by six of the seven members of the committee. D. E. Fitzgerald, the other member of the committee, is not present at this conference. I understand that Mr. Meek is preparing in the near future to send out certain questionnaires to the members of the conference, and I bespeak for him prompt and adequate replies to the questions that he asks in order that the subject may be fully developed.

(A motion was made and seconded that the report be accepted, the question was taken, and the motion was agreed to.)

GENERAL CONSIDERATION OF SUBJECTS OF INTEREST AND QUESTIONS BROUGHT UP FOR DISCUSSION BY OFFICIALS

The Chairman. The next item is, "General consideration of subjects of interest and questions brought up for discussion by officials." I might add also, by others if they wish. At this time, gentlemen, the opportunity is given to bring before the conference for consideration all subjects of interest which have not been included in the formal program. If any persons have any matters which they wish to bring to the attention of the conference, now is the time to do so.

Mr. Neale. Mr. President, this may not exactly be the proper time, but a friend and strong supporter of this conference, M. D. Ribble, whom you all know, sends greetings from New Mexico.

Mr. Sweeney. Mr. Chairman, I wish to call the attention of the conference at this time to a question arising in the testing of taximeters.

Formerly, when the front-wheel drive was employed, we had very little difficulty in proving the correctness of the meters through a bench test, and under Massachusetts requirements a bench test is

[7] In the absence of Mr. Meek this report was read to the conference by F. S. Holbrook, secretary.

Digitized by Google

required and must be given before a taximeter is affixed to the cab. Now that transmission drives are being employed we find that complications arise owing to the gears necessarily employed with this type of drive, and that a bench test is almost valueless. I have made some experiments in an effort to discover a real solution of this condition. I have made comparisons between various tests and checked the number of revolutions per mile and have discovered that if you accurately measure the circumference of the wheels, it may be possible to prove a meter by a wheel test and not necessarily make a road test. Of course, this raises a very important question, as to whether or not such a test would be deemed a correct one, meeting all legal requirements, because, after all, a road test is the best and most logical way to determine the correctness of a meter affixed to the transmission drive.

I feel that it might be the consensus of the conference, if my observations and determinations have proved somewhat the correctness of the method, that the adoption of such a plan upon the part of the sealers would have its approval, particularly in jurisdictions where congestion on the roads is great. I merely mention that at this time in the hope of securing, if possible, a little more cooperation on the part of the manufacturers of taximeters. Perhaps their engineers can devise some method of test that will be correct and save the sealer much work, particularly in those cities where they have an abundance of work to do in that particular line. I feel it would be an especially good thing for the bureau to take this matter up with the manufacturers of taximeters to the end that something definite be brought about to save the sealers a lot of unnecessary work and at the same time satisfy the public in general.

The CHAIRMAN. You have brought up an important matter. Is there any comment on Mr. Sweeney's remarks?

Does any other member or guest of the conference desire to bring up any items?

RESIGNATION OF THE TREASURER, GEORGE F. AUSTIN

The CHAIRMAN. Before proceeding to the report of committee on nominations and election of officers, I would like to read a letter I have just received from our treasurer, George F. Austin, whom we know very well indeed, and who has been treasurer of this conference for a number of years. I regret that he finds it necessary to retire from active duty as treasurer.

BUREAU OF WEIGHTS AND MEASURES,
1300 Beaubien Street, Detroit, Mich., June 1, 1930.

Mr. PRESIDENT, OFFICERS, AND MEMBERS OF THE NATIONAL CONFERENCE ON WEIGHTS AND MEASURES ASSEMBLED:

In consideration of my decision to retire from weights and measures activities in the near future, I herewith present my resignation as treasurer of the National Conference.

It is with sincere regret that I feel compelled, at this time, to sever my official connection in the National Conference, with which I have been actively associated for more than 20 years, and served as treasurer for the past six years.

I shall remember with pleasure the warm friendships which have come to me through these conferences, and I thank you for the many courtesies and honors conferred upon me.

Yours very truly,

GEORGE F. AUSTIN, *Treasurer.*

Digitized by Google

REPORT OF COMMITTEE ON NOMINATIONS, PRESENTED BY FRANCIS MEREDITH, CHAIRMAN, AND ELECTION OF OFFICERS

Mr. Chairman and gentlemen, your committee on nominations respectfully submits the following names of members of the conference as nominees for officers and members of the executive committee for the ensuing year:

Honorary president, S. W. Stratton; president, George K. Burgess; first vice president, Howard S. Jarrett; second vice president, Albert B. Smith; secretary, F. S. Holbrook; treasurer, George F. Austin, jr.; members of executive committee, all of the officers ex officio, W. F. Cluett, E. J. Crouch, H. N. Davis, C. V. Fickett, Thomas Flaherty, J. H. Foley, William Foster, W. A. Graham, S. T. Griffith, T. F. Mahoney, E. J. Maroney, I. L. Miller, C. R. McFadden, W. A. Payne, B. W. Ragland, G. M. Roberts, W. F. Steinel, V. A. Stovall, H. A. Webster, S. H. Wilson.

(At this point Mr. Meredith assumed the chair.)

The Acting Chairman. Gentlemen, you have heard the report of the committee on nominations. What is your action?

(It was moved and seconded that the report of the committee be accepted, the question was taken, and the motion was agreed to.)

(It was moved and seconded that the nominations be closed, and that the secretary be directed to cast the ballot of the conference for the officers and members of the executive committee, as nominated, the question was taken, and the motion was agreed to.

Accordingly, the secretary cast the ballot of the conference for the officers and members of the executive committee as nominated by the committee on nominations, and they were declared duly elected.)

The Acting Chairman. Doctor Burgess, it gives me the greatest pleasure on behalf of the conference to escort you to the chair.

(Doctor Burgess assumed the chair.)

Doctor Burgess. Gentlemen, as president-elect of this conference I feel in a very great measure the obligation imposed. I also have a great feeling of appreciation that you have sufficient confidence in the Director of the Bureau of Standards to elect him again to this office.

REPORT OF COMMITTEE ON RESOLUTIONS, PRESENTED BY ALBERT B. SMITH, CHAIRMAN

Mr. Chairman and members of the conference, your committee on resolutions has the following resolutions to submit for your consideration:

ADDRESS OF THE ASSISTANT SECRETARY OF COMMERCE, HON. JULIUS KLEIN

Resolved, That the Twenty-third National Conference on Weights and Measures hereby extends to Dr. Julius Klein, Assistant Secretary of Commerce, its thanks and appreciation for his attendance at this conference and for the excellent address delivered thereat.

ADDRESS OF HON. RANDOLPH PERKINS

Resolved, That we, the delegates to the Twenty-third National Conference on Weights and Measures, extend to the Hon. Randolph Perkins, chairman of the Committee on Coinage, Weights, and Measures, of the House of Repre-

Digitized by Google

sentatives of the Congress of the United States, our sincere appreciation and thanks for his very inspiring and instructive address and for his continued interest and assistance in our work.

APPRECIATION TO THE DIRECTOR AND STAFF OF THE BUREAU OF STANDARDS

Resolved, That the Twenty-third National Conference on Weights and Measures hereby records its sincere and grateful appreciation for the valuable assistance extended by our president, Dr. George K. Burgess, and his able staff, in the interest and guidance of its deliberations.

RETIREMENT OF GEORGE F. AUSTIN

Whereas Inspector George F. Austin, chief of the weights and measures department of Detroit, has advised the conference of his decision to retire from weights and measures work; and

Whereas Inspector Austin's career has been a long, faithful, and eminently satisfactory one, during which he has furnished a splendid service to the public of his city; and

Whereas Inspector Austin has long been an eminent member of this conference and has served it faithfully as its treasurer: Therefore be it

Resolved, That we, the delegates to this Twenty-third National Conference on Weights and Measures, assembled in Washington, D. C., June 3 to 6, 1930, hereby record our regret at the retirement of Inspector Austin from our councils and wish him enjoyment in his well-merited rest after an arduous career.

CHEMICALLY-TREATED COAL

Resolved, That we, the delegates to the Twenty-third National Conference on Weights and Measures, assembled at Washington, D. C., June 3 to 6, 1930, declare it to be our opinion at this time that the so-called calcium chloride method of treating coal to make it dustless is not objectionable from a weights and measures standpoint, when by this process the weight of the coal is not increased by more than 30 pounds per ton, and when, in addition, the coal so treated is described on the delivery ticket and billed to the consumer as "chemically treated" coal.

LUBRICATING-OIL BOTTLES NOT COMPLYING WITH SPECIFICATIONS

Whereas lubricating-oil dispensing bottles have been placed in service in many parts of the country which far exceed the over-all height allowable by the lubricating-oil bottle code, and which do not comply with its requirements for capacity markings; and

Whereas exemption from compliance with the code is claimed on the basis that the bottles are containers and not measures, because of the fact that the oil is measured into the bottles and the bottles then sealed; and

Whereas the oil is not delivered to the customer as in the case of other packaged commodities but is transferred to the engine crank case by the station attendant in the usual manner: Therefore be it

Resolved, That it is the opinion of the Twenty-third National Conference on Weights and Measures that these bottles are, in effect, measures, and that they may be readily employed to deceive and to perpetrate fraud upon the customer; and be it further

Resolved, That the conference strongly disapproves these bottles and any others for use in dispensing lubricating oils which do not comply with the code.

MOLDS AND MACHINE-FILLED CARTONS FOR ICE CREAM

Whereas a general conference of producers, distributors, and users of molds and machine-filled cartons for brick ice cream, held in Washington, D. C., under the auspices of the division of simplified practice of the Bureau of Standards, adopted the following simplified schedule of dimensions for the 2-gallon mold and for machine-filled pint and quart cartons for brick ice cream:

Digitized by Google

Two-gallon mold

Length	Width	Depth
26 inches	6¼ inches	2⅞ inches

Machine-filled cartons

PINT

No. 1 U. S. standard, $3\frac{3}{16}$ by 3½ by $2\frac{11}{16}$ inches
No. 2 U. S. standard, $2\frac{7}{16}$ by 3⅛ by $3\frac{1}{16}$ inches

QUART

No. 1 U. S. standard, $2\frac{11}{16}$ by 3½ by 6¼ inches
No. 2 U. S. standard, $2\frac{7}{16}$ by 3⅛ by 7¾ inches

and

Whereas these sizes as adopted are standard sizes and provide an oversize margin to allow for the parchment or waxed-paper liner of the carton; and

Whereas the above action will result in a very desirable simplification of sizes and dimensions: Therefore be it

Resolved, That we, the delegates to the Twenty-third National Conference on Weights and Measures, assembled in Washington, D. C., June 3 to 6, 1930, hereby go on record as approving at this time the sizes mentioned above when used for dispensing ice cream by measure.

APPRECIATION TO MANUFACTURERS DEMONSTRATING GASOLINE METERS

Whereas much valuable information concerning the construction and operation of meters employed in retailing petroleum products was furnished through the courtesy of the various meter manufacturers: Therefore be it

Resolved, That we, the delegates to the Twenty-third National Conference on Weights and Measures, held in Washington, D. C., June 3 to 6, 1930, do hereby extend our most grateful appreciation for their valuable assistance and for the information disseminated.

COMMENDATION TO FAR WESTERN STATES FOR REPRESENTATION AT CONFERENCE

Resolved, That the Twenty-third National Conference on Weights and Measures, in assembly met, does hereby thank and especially commend the Far Western States which have sent representatives to this conference, thereby showing their interest in our work; and be it further

Resolved, That a copy of this resolution be sent to the States in question.

GEORGE WASHINGTON BICENTENNIAL

Whereas the Congress of the United States has created a commission to arrange a fitting nation-wide observance of the Two-Hundredth Anniversary of the Birth of George Washington in 1932; and

Whereas the commission so created, composed of the President of the United States, the Vice President of the United States, the Speaker of the House of Representatives, four Members of the United States Senate, four Members of the House of Representatives, and eight citizens appointed by the President of the United States, is charged with the duty of planning and directing the celebration; and

Whereas the high purpose of the event is to commemorate the life, character, and achievements of the most illustrious citizen of our Republic and to give every man, woman, and child living under the Stars and Stripes an opportunity to take part in the celebration which will be outstanding in the world's history; and

Whereas the George Washington Bicentennial Commission, desiring the full cooperation of the people in the United States, has extended a most cordial and urgent invitation to our organization to participate in the celebration: Therefore be it

Digitized by Google

Resolved, That the Twenty-third National Conference on Weights and Measures does hereby indorse the program of observance of the Two-Hundredth Anniversary of the Birth of George Washington, to take place in 1932, accept with appreciation, the invitation of the George Washington Bicentennial Commission, and pledge this organization to extend earnest cooperation to the United States Commission in all possible ways, so that future generations of American citizens may be inspired to live according to the example and precepts of Washington's exalted life and character, and thus perpetuate the American Republic; and be it further

Resolved, That this resolution be incorporated in the official proceedings of this meeting and that a copy thereof be transmitted to the George Washington Bicentennial Commission, Washington, D. C.

APPRECIATION TO HEADQUARTERS HOTEL MANAGEMENT

Resolved, That we, the delegates to the Twenty-third National Conference on Weights and Measures, hereby tender our thanks and appreciation to the management of the Hotel Washington, our conference headquarters, for the many courtesies extended the delegates during our meeting.

APPRECIATION TO THE PRESS

Resolved, That the Twenty-third National Conference on Weights and Measures hereby extends the thanks and appreciation of the Conference to the press of Washington, D. C., for the publicity given its proceedings.

DISCUSSION OF REPORT OF COMMITTEE ON RESOLUTIONS

The CHAIRMAN. You have heard this very interesting report of the committee on resolutions. Do you wish to consider the report of the committee as a whole? What is your pleasure?

Mr. MAHN. Mr. Chairman, I would like to ask Mr. Smith one question in relation to the resolution on ice-cream containers. He read the figures, but I do not know exactly how those figure out in terms of capacity. We had some trouble in my county with the pint brick which was put into a container which was much larger than the brick itself. Almost everybody thought they were receiving short measure. I do not think the container should be so much oversize as to have that effect.

Mr. HOLBROOK. I am somewhat familiar with those containers adopted, and I may say, in general, that the 2-gallon mold is 1.1 per cent oversize and the machine-filled cartons are from 1.8 to 3.9 per cent oversize. These cartons were made intentionally large for this reason: When the container is used, a wax-paper lining is normally included, and were the container to be of the exact size, the ice cream contained therein would be short by the volume occupied by the paper liner. Therefore, these containers were standardized oversize in order to take care of that situation and furnish the proper amount of ice cream to the consumer.

I might also state that these cartons are machine filled. The ice cream is put in the carton when in a semisolid state and is frozen in the carton. That will result in a completely filled package in every case.

(It was moved and seconded that the resolutions presented by the committee be adopted, the question was taken, and the motion was agreed to.)

Digitized by Google

RESOLUTION IN RELATION TO STANDARDIZATION ACTIVITIES OF THE NATIONAL SCALE MEN'S ASSOCIATION

Mr. HOLBROOK. Mr. Chairman, may I introduce at this time an additional resolution, as follows:

Whereas M. J. J. Harrison, representing the National Scale Men's Association, has outlined to this conference several standardization activities of that association, and it appears that these activities are both important and meritorious ones: Therefore be it

Resolved, That we, the delegates to the Twenty-third National Conference on Weights and Measures, assembled at Washington, D. C., June 3 to 6, 1930, do hereby extend our congratulations to the National Scale Men's Association upon these accomplishments, record our appreciation of the excellent paper presented, and assure this association of our continued cooperation in activities such as these.

(The resolution was duly adopted.)

REPORT OF THE TREASURER, GEORGE F. AUSTIN [8]

Gentlemen of the conference, I herewith submit my report as treasurer of the National Conference on Weights and Measures for the year ending June 3, 1930.

Receipts:		
Balance on hand June 3, 1929		$306.24
Received through fees from delegates		179.00
Received account of interest		14.77
Total receipts		500.01
Disbursements:		
Flowers in memory of L. A. Fischer	$10.00	
Flowers for Mr. Knauss	10.00	
Flowers for A. W. Schwartz	5.00	
Cigars, Mr. Knauss, reporting conference	15.00	
For special services incident to the conference	7.00	
Candy for stenographers	9.00	
Four receipt books	1.00	
Total disbursements		57.00
Balance on hand June 3, 1930		443.01

Respectfully submitted.

(Signed) GEO. F. AUSTIN, *Treasurer.*

(The report was duly accepted.)

Mr. SCHWARTZ. It is very seldom that one sits in a conference and listens to a bill being offered for flowers for himself. This time, I certainly do want to extend my appreciation and thanks to my conference friends for flowers received by me while I was confined to a hospital by illness last July. I am glad to be able to be here, and I am glad I was able to appreciate the flowers sent.

WREATH IN MEMORY OF LOUIS A. FISCHER

Mr. HOLBROOK. Mr. Chairman, may I state that in accordance with our usual custom Ralph Smith and myself visited Arlington Cemetery just before Memorial Day and placed the tribute of this conference on the grave of our beloved former secretary, Maj. Louis A. Fischer.

[8] In the absence of Geo. F. Austin this report was presented to the conference by George F. Austin, jr.

Digitized by Google

MOTION IN RELATION TO EXPENDITURES

Mr. SCHWARTZ. I move you, sir, that the secretary of the conference be authorized to make the customary expenditures incident to this conference and to draw upon the conference treasurer for the funds so expended.

(The motion was seconded, the question was taken, and the motion was agreed to.)

SUGGESTION AS TO PROGRAM OF TWENTY-FOURTH CONFERENCE

The CHAIRMAN. This item on the program is one which makes for the success of the next conference. The Chair feels that this conference has been particularly successful and very interesting. We have had some very lively sessions, the opportunity has been given for free discussion, and we have accomplished a great deal. Now is the time for anyone having a suggestion to make for the coming conference to present it. If ideas do not come to you at the present moment, but when you return home you think of any special problems, write in and inform the executive committee.

I would like to ask if the date is satisfactory. I appreciate that you had a warm welcome, but you save money by having it in June rather than at the end of May.

DESIRABILITY OF SPECIFICATIONS AND TOLERANCES FOR PERSON-WEIGHING SCALES

Mr. HOLBROOK. Mr. Chairman, for the guidance of the Committee on Specifications and Tolerances in their work during the coming year I would like to develop the consensus of the conference as to the advisability of drawing up a code of specifications and tolerances for person-weighing scales to be presented at the next meeting. Is there a demand on the part of the members of the conference for a code of that kind? You will realize that while we have adopted a code for automatic-indicating scales there are many special considerations in relation to person-weighing scales that will make it necessary to adopt a special code, if you desire to have uniformity of regulations pertaining to these scales. Do any of the members desire to express an opinion on the necessity for a code of that kind?

Mr. FOSTER. I think the suggestion is a very good one. As far as we are concerned, we have such a code in Massachusetts. It would be very helpful.

Mr. MEREDITH. I am very much in favor of the idea. In considering devices of this kind, if there is no special code, it very frequently becomes necessary to reach out to other codes and give a good deal of consideration to the question of selecting such specifications therefrom as appear to be applicable. If I understand the suggestion correctly, it would simplify the matter by providing for a code directly concerned with the subject mentioned. I am very much in favor of it.

Mr. A. B. SMITH. Pennsylvania would welcome such action on the part of your committee.

Mr. SWEENEY. Mr. President, in view of the fact that it seems to be the consensus of opinion that the various States are in favor of

Digitized by Google

such action, I move you, sir, that the Committee on Specifications and Tolerances be instructed to proceed to draw up a code for person-weighing machines, to be presented at the next conference to be held in 1931.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. AUSTIN. In connection with the motion to have a code presented on the person-weighing scales, I think it would be a good thing. Unfortunate conditions exist throughout the country in connection with these devices. I know we get calls quite often and we are impressed by conditions as they actually exist. In walking about, your weight may appear to vary from 1 to 5 pounds in 15 minutes. A code ought to be of material benefit.

Mr. MEREDITH. It occurs to me, Mr. President, to wonder whether or not the subject ought to be enlarged upon somewhat. The term "coin-operated scales" is sometimes used, and this class, while involving person-weighing scales, is somewhat broader, since such a scale might provide some other service. This might be given consideration in connection with the discussion.

Mr. GRIFFITH. Mr. President, if we confined the matter to the coin-operated scale, that would not necessarily cover the person-weighing machines, because a great many institutions provide these free for the use of their patients, but still I think they might be included in such a code.

The CHAIRMAN. Is there any other suggestion for the next conference?

Of course, you understand that the conference is in your own hands. You should suggest what you want to talk about, and you will have an opportunity between now and two months before the next conference to bring in suggestions.

Mr. HOLBROOK. The conference has a very courteous invitation extended by Dr. L. S. Rowe, Director General of the Pan American Union, to visit and examine the Pan American Building. Unfortunately there was no time available to allow us to go there as a body, but I am very sure that the persons in charge would be very happy to receive you singly in the event that you have time this afternoon to visit the building. I may say that it is one of the most beautiful buildings in Washington and will well repay an inspection.

The CHAIRMAN. Is there any further business, gentlemen?

(A motion was made and seconded that the conference adjourn, the question was taken, and the motion was agreed to.)

(Thereupon, at 11.45 o'clock a. m., the Twenty-Third National Conference on Weights and Measures adjourned sine die.)

Digitized by Google

APPENDIX

SPECIFICATIONS AND TOLERANCES FOR AUTOMATIC-INDICATING SCALES, ADOPTED BY THE TWENTY-THIRD NATIONAL CONFERENCE ON WEIGHTS AND MEASURES, JUNE 5, 1930

FOREWORD

The Twenty-Third National Conference on Weights and Measures adopted the following code of specifications and tolerances with the recommendation that it be put into effect not earlier than July 1, 1931.

SPECIFICATIONS AND TOLERANCES

DEFINITION.—An automatic-indicating scale is a scale in which is embodied or to which is attached a self-acting mechanism, the capacity of which may be equal to or less than the total capacity of the scale, through the agency of which the indicated or recorded weights of variable loads may be obtained. This definition is not to be construed to include scales which automatically weigh out commodities in predetermined drafts, such as automatic grain hopper scales, packaging scales, etc. Automatic-indicating scales may be of any one of the following types as classified and defined in these codes of specifications and tolerances: Platform scales (including counter platform scales), counter scales, spring scales, straight-face spring scales, and computing scales. Each automatic-indicating scale shall be subject to the following specifications and to those given under the heading "Scales—General Specifications"; and in addition each scale falling within the definition of any of the classes mentioned above shall be subject to the specifications for such class except in so far as they may be modified by the specifications herein.

SPECIFICATIONS.—1. The weight dial or reading face, or the indicator, whichever is designed as the stationary element, shall be securely fixed in position; the moving element of the combination shall be securely attached to its operating mechanism: Provided, however, That this specification shall not be construed to prohibit the employment of a movable auxiliary dial or reading face or a movable auxiliary indicator designed to be rotated or moved in reference to a fixed dial or reading face or a fixed indicator, respectively, for the purpose of "balancing out" tare weights.

2. All weight graduations on the dial or reading face shall be clear and distinct and in no case shall their width be less than 0.008 inch *nor more than the width of the clear interval between the graduations. Corresponding graduations shall be equal in width. Main graduations shall not be more than 50 per cent wider than subordinate graduations.*

3. There shall be a clear interval between the weight graduations on the dial or reading face and this interval shall in no case be less than 0.04 inch. This interval is to be measured between the adjacent

Digitized by Google

edges of successive graduations representing the smallest subdivision on the dial or reading face, and along the line of travel of the index of the indicator and shall be maintained whether or not the graduations are "staggered" or arranged alternately; that is, when the graduations are staggered the interval shall be construed to be the space from one graduation to the next consecutive graduation extended, if necessary, to intersect the line of measurement. When the graduations are not parallel the interval shall be construed to be the widest separation of the graduations which is included within the travel of the index of the indicator.

4. The value of the minimum graduation on the dial or reading face shall be construed to be the smallest weight value represented by the travel of the indicator from the center of any graduation to the center of the next succeeding graduation.

5. An automatic-indicating scale shall have a definite and clear zero graduation and shall be susceptible of giving an indication back of the zero graduation sufficient clearly to disclose an out-of-balance condition. These conditions shall be fulfilled whether the entire dial or reading face is graduated or the graduations commence at a fixed load.

6. All weight indicators shall be so designed and constructed that the indications are definite and may be read with precision.

7. All weight indicators shall reach to the graduations; or if the construction is such that the indicator and the dial or reading face are in the same plane then there shall not be a separation of the ends of the graduations and the end of the indicator, of more than 0.04 inch, this distance to be measured along the line of the graduations.

8. When a weight indicator extends along the entire length of a graduation then all that portion of the indicator which may be brought into coincidence with the graduation shall be the same width throughout.

9. *The clearance between the index of the indicator and the dial or reading face shall not exceed 0.06 inch in the case of all automatic-indicating scales except spring scales not equipped with a device intended to compensate for changes in the elasticity of the springs due to temperature effects; in this latter class of scales this clearance shall not exceed 0.12 inch.* Provided, however, That this shall not be construed to prohibit the employment of an additional indicator at a greater distance from the dial or reading face, designed and constructed so as to facilitate the correct positioning of the eye of the observer properly to read the indications of the scale and reduce parallax, when such additional indicator is clearly differentiated from the weight indicator so that it will not be mistaken therefor.

10. When tests are being made with both increasing and decreasing loads on any automatic-indicating scale, the indications on all increasing loads shall be within the normal tolerances provided, and also at any stage of the test the range between corresponding observations for increasing and decreasing loads shall not be greater than the sum of the tolerances in excess and in deficiency for the load in question.

11. An automatic-indicating scale shall be so designed and constructed that the element supplying the counterforce, such as the

Digitized by Google

spring, the pendulum, etc., is securely held in adjustment and this element shall not be adjustable from the outside of the scale; that is, a partial disassembling of the scale mechanism or of the housing shall be required to reach any adjustable parts provided. (This specification does not refer to the means commonly provided for adjusting the zero balance condition of a scale.)

TOLERANCES.—Except on the special tests described above, the tolerances to be allowed on any automatic-indicating scale shall be the tolerances allowed on the class to which the scale under test belongs; these will be found under the specific heading embracing such class.



Digitized by Google

U. S. DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS

REPORT OF THE TWENTY-FOURTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

ATTENDED BY REPRESENTATIVES
FROM VARIOUS STATES

HELD AT THE BUREAU OF STANDARDS
WASHINGTON, D. C., JUNE 2, 3, 4, AND 5, 1931

MISCELLANEOUS PUBLICATIONS—No. 129

JAN 4 1932

CORNELL
UNIVERSITY
LIBRARY

Digitized by Google

CORNELL
UNIVERSITY
LIBRARY

Digitized by Google

U. S. DEPARTMENT OF COMMERCE
R. P. LAMONT, Secretary
BUREAU OF STANDARDS
GEORGE K. BURGESS, Director

MISCELLANEOUS PUBLICATIONS—No. 129

REPORT OF THE TWENTY-FOURTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

ATTENDED BY REPRESENTATIVES
FROM VARIOUS STATES

HELD AT THE BUREAU OF STANDARDS
WASHINGTON, D. C., JUNE 2, 3, 4, and 5, 1931

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1931

For sale by the Superintendent of Documents, Washington, D. C. - - - Price 50 cents

CORNELL
UNIVERSITY
LIBRARY

Digitized by Google

Digitized by Google

OFFICERS AND COMMITTEES

OFFICERS

Honorary president, SAMUEL W. STRATTON, chairman of the executive committee, Massachusetts Institute of Technology, Cambridge, Mass., and former Director of the Bureau of Standards, Washington, D. C.

(Serving during twenty-fourth national conference)

President, GEORGE K. BURGESS, Director, Bureau of Standards, Washington, D. C.
First vice president, HOWARD S. JARRETT, State commissioner of weights and measures, Charleston, W. Va.
Second vice president, ALBERT B. SMITH, director, State bureau of standard weights and measures, Harrisburg, Pa.
Secretary, F. S. HOLBROOK, Bureau of Standards, Washington, D. C.
Treasurer, GEORGE F. AUSTIN, Jr., supervising inspector of weights and measures, Detroit, Mich.

(As elected by twenty-fourth national conference for the ensuing year)

President, GEORGE K. BURGESS, Director, Bureau of Standards, Washington, D. C.
First vice president, ALBERT B. SMITH, director, State bureau of standard weights and measures, Harrisburg, Pa.
Second vice president, I. L. MILLER, State commissioner of weights and measures, Indianapolis, Ind.
Secretary, F. S. HOLBROOK, Bureau of Standards, Washington, D. C.
Treasurer, GEORGE F. AUSTIN, Jr., supervising inspector of weights and measures, Detroit, Mich.

COMMITTEES

EXECUTIVE COMMITTEE

(As elected by twenty-fourth national conference)

GEORGE K. BURGESS.
ALBERT B. SMITH.
I. L. MILLER.
F. S. HOLBROOK.
GEORGE F. AUSTIN, Jr.
} *Ex officio.*

HOWARD E. CRAWFORD, inspector of weights and measures, Jacksonville, Fla.
H. N. DAVIS, deputy State commissioner of weights and measures, Montpelier, Vt.
S. C. DINSMORE, State sealer of weights and measures, Reno, Nev.
C. V. FICKETT, sealer of weights and measures, Portland, Me.
THOMAS FLAHERTY, city and county sealer of weights and measures, San Francisco, Calif.
W. T. FOSSETT, State superintendent of standards, Springfield, Ill.
WILLIAM A. GRAHAM, State commissioner of agriculture, Raleigh, N. C.
S. T. GRIFFITH, chief, division of weights and measures, Baltimore, Md.
JOHN H. HENNESSEY, superintendent of weights and measures, Providence, R. I.
D. P. KIMBALL, sealer of weights and measures, Phoenix, Ariz.
EDWARD J. MABONEY, sealer of weights and measures, New Haven, Conn.
FRANCIS MEREDITH, State director of standards, Boston, Mass.
WILLIAM A. PAYNE, sealer of weights and measures of Monroe County, Rochester, N. Y.

Digitized by Google

B. W. RAGLAND, chief, bureau of weights and measures, Richmond, Va.
GEORGE M. ROBERTS, superintendent of weights, measures, and markets, Washington, D. C.
JOSEPH G. ROGERS, assistant superintendent of weights and measures, Trenton, N. J.
P. T. SULLIVAN, State inspector of weights and measures, Moundsville, W. Va.
J. C. TINKEY, deputy State sealer of weights and measures, Columbus, Ohio.
GEORGE WARNER, chief State inspector of weights and measures, Madison, Wis.
H. A. WEBSTER, State commissioner of weights and measures, Concord, N. H.

COMMITTEE ON SPECIFICATIONS AND TOLERANCES

(Standing committee)

F. S. HOLBROOK, Bureau of Standards, Washington, D. C.
CHARLES M. FULLER, city and county sealer of weights and measures, Los Angeles, Calif.
I. L. MILLER, State commissioner of weights and measures, Indianapolis, Ind.
JOSEPH G. ROGERS, assistant State superintendent of weights and measures, Trenton, N. J,
WILLIAM A. PAYNE, sealer of weights and measures of Monroe County, Rochester, N. Y.

COMMITTEE ON UNIFORMITY IN WEIGHTS AND MEASURES REQUIREMENTS

J. H. MEEK, director, State division of markets, Richmond, Va.
P. D. DUKESHERER, director, State bureau of foods and standards, Lansing, Mich.
D. E. FITZGERALD, sealer of weights and measures, Racine, Wis.
PHILIP T. PILON, State inspector of weights and measures, Hartford, Conn.
ALBERT B. SMITH, director, State bureau of standard weights and measures, Harrisburg, Pa.
C. P. SMITH, sealer of weights and measures of Suffolk County, Riverhead, N. Y.

ACTING COMMITTEES FOR THE TWENTY-FOURTH NATIONAL CONFERENCE

Committee on resolutions.—GEORGE WARNER, of Wisconsin, chairman; H. A. WEBSTER, of New Hampshire; S. C. DINSMORE, of Nevada; C. D. BAUCOM, of North Carolina; GLENN L. BERRY, of Monmouth County, N. J.; C. B. TOLAN, of Fort Wayne, Ind.; and M. C. GRIFFIN, of Hartford County, Conn.

Committee on nominations.—HOWARD S. JARRETT, of West Virginia, chairman; FRANCIS MEREDITH, of Massachusetts; W. A. CARLETON, of Illinois; B. FRANK RINN, of Allentown, Pa.; and J. H. STEPHENSON, of Rochester, N. Y.

OFFICIAL STENOGRAPHER

NORMAN L. KNAUSS, Bureau of Standards, Washington, D. C.

Digitized by Google

LIST OF PERSONS ATTENDING THE CONFERENCE

DELEGATES—STATE, COUNTY, AND CITY OFFICIALS

ARIZONA

City: Phoenix — D. P. KIMBALL, sealer of weights and measures, City Hall.

CALIFORNIA

City and County: San Francisco — THOMAS FLAHERTY, sealer of weights and measures, room 6, City Hall, San Francisco.

CONNECTICUT

State — PHILIP T. PILON, inspector of weights and measures, 100 Washington Street, Hartford.

City:
- Hartford — LOUIS ELSNER, sealer of weights and measures, 550 Main Street.
- New Haven — EDWARD J. MARONEY, sealer of weights and measures, City Hall.

County:
- Fairfield — WILLIAM H. BROWN, sealer of weights and measures, Courthouse, Bridgeport.
- Hartford — MILO C. GRIFFIN, sealer of weights and measures, 95 Washington Street, Hartford.
- New Haven — WILLIAM P. TYLER, sealer of weights and measures, Courthouse, New Haven.

DISTRICT OF COLUMBIA

District — GEORGE M. ROBERTS, superintendent of weights, measures, and markets, District Building, Washington.
W. C. DILLER, chief inspector of weights, measures, and markets, District Building, Washington.
GEORGE A. HOWE, inspector of weights, measures, and markets, District Building, Washington.
G. STUART REEDER, inspector of weights, measures, and markets, District Building, Washington.
GEORGE C. WRIGHT, inspector of weights, measures, and markets, District Building, Washington.

FLORIDA

City: Jacksonville — HOWARD E. CRAWFORD, inspector of weights and measures.

GEORGIA

State — S. H. WILSON, State oil chemist, room 134, State Capitol, Atlanta.

ILLINOIS

State — W. T. FOSSETT, superintendent of standards, State Capitol, Springfield.
W. A. CARLETON, inspector of standards, 207 North Street, Hinsdale.

Digitized by Google

INDIANA

State	I. L. MILLER, commissioner of weights and measures, room 201, Statehouse Annex, Indianapolis.
City: Fort Wayne	C. B. TOLAN, inspector of weights and measures, City Hall.
City and County: Huntington	DEFOREST MCLIN, inspector of weights and measures, Huntington.

MAINE

City: Portland	C. V. FICKETT, sealer of weights and measures, City Building.

MARYLAND

City: Baltimore	S. T. GRIFFITH, chief, division of weights and measures, City Hall.
	CHARLES G. CROCKETT, inspector of weights and measures, City Hall.
	LOUIS G. EBERHARDT, inspector of pharmaceutical scales, City Hall.
	JAMES T. EVERETT, inspector of weights and measures, City Hall.
	WILLIAM H. LARRIMORE, inspector of weights and measures, City Hall.
	GEORGE H. LEITHAUSER, inspector of weights and measures, City Hall.
	THOMAS J. NAPFEL, inspector of weights and measures, City Hall.
	ELMER E. NICHOLSON, inspector of weights and measures, City Hall.
	ELMER S. PIERPONT, inspector of weights and measures, City Hall.
	CHARLES RUSTEBERG, inspector of weights and measures, City Hall.
	HENRY SLITZER, assistant inspector of weights and measures, City Hall.
County: Washington	D. FRANK MILLER, inspector of weights and measures, Boonsboro.

MASSACHUSETTS

State	FRANCIS MEREDITH, director of standards, room 194, Statehouse, Boston.
City:	
Belmont	ELDORUS A. CASTNER, sealer of weights and measures, 612 Grapelo Road.
Beverly	ROBERT J. RAFFERTY, sealer of weights and measures, City Hall.
Boston	JAMES A. SWEENEY, sealer of weights and measures, room 105, City Hall Annex.
Danvers	JOHN D. BRUMMITT, sealer of weights and and measures, Town Hall.
Medford	JOHN J. CAREW, sealer of weights and measures.
Natick	CHARLES H. HOLLIS, sealer of weights and measures, 20 Waban Street.
Taunton	EDWARD C. WARD, sealer of weights and measures.
West Newton	ANDREW PRIOR, sealer of weights and measures, City Hall.

MICHIGAN

State	L. P. STRONG, chief, division of weights and measures, Lansing.
City:	
Detroit	GEORGE F. AUSTIN, Jr., supervising inspector of weights and measures, 1300 Beaubien Street.
Lansing	CARL A. BUNDENTHAL, sealer of weights and measures, Municipal Market Building.

Digitized by Google

MINNESOTA

State	D. F. JURGENSEN, chief engineer, railroad and warehouse commission, State Capitol, St. Paul.

MISSOURI

City: St. Louis	WILLIAM H. HUBELE, commissioner of weights and measures, City Hall.

NEVADA

State	S. C. DINSMORE, sealer of weights and measures, Reno. W. B. ADAMS, deputy sealer of weights and measures, Reno.

NEW HAMPSHIRE

State	H. A. WEBSTER, commissioner of weights and measures, Statehouse, Concord. E. P. JONES, inspector of weights and measures, Chester.
City: Manchester	ARTHUR J. PROVENCHER, sealer of weights and measures, 180 Franklin Street.

NEW JERSEY

State	JOSEPH G. ROGERS, assistant superintendent of weights and measures, 187–189 West Hanover Street, Trenton. FRANCIS LEO BRUGGY, assistant superintendent of weights and measures, 187–189 West Hanover Street, Trenton. ELLIOTT B. HOLTON, assistant superintendent of weights and measures, 187–189 West Hanover Street, Trenton. HARRY S. PROVOST, assistant superintendent of weights and measures, 187–189 West Hanover Street, Trenton.
City:	
Clifton	GARRET N. DEVRIES, superintendent of weights and measures.
Elizabeth	WILLIAM J. BENDER, superintendent of weights and measures, Harmonia Building.
Jersey City	JOHN S. BURKE, superintendent of weights and measures, City Hall.
Kearny	JOHN D. CASTLES, superintendent of weights and measures.
Newark	PATRICK J. CAUFIELD, superintendent of weights and measures, City Hall.
Trenton	FRANCIS J. BLACK, superintendent of weights and measures, City Hall.
County:	
Bergen	A. F. BARNARD, superintendent of weights and measures, 29 Main Street, Hackensack.
Cape May	GILBERT S. SMITH, superintendent of weights and measures, Avalon.
Gloucester	WILLIAM P. ABDILL, superintendent of weights and measures, Woodbury.
Hudson	THOMAS J. WALDRON, superintendent of weights and measures, Courthouse, Jersey City.
Mercer	RALPH M. BODENWIESER, superintendent of weights and measures, Trenton.
Middlesex	JOSEPH FERTIG, superintendent of weights and measures, 184 Livingston Avenue, New Brunswick.
Monmouth	GLENN L. BERRY, superintendent of weights and measures, Asbury Park. ROBERT M. MARKS, assistant superintendent of weights and measures, Manasquan.

Digitized by Google

County—Continued	
Morris	HENRY S. WORMAN, superintendent of weights and measures, Boonton.
Somerset	MELVIN H. CLEAVES, superintendent of weights and measures, Somerville.
Sussex	R. LEE SLATER, superintendent of weights and measures, Newton.
Union	ISAAC SEELEY, superintendent of weights and measures, Courthouse, Elizabeth.
	NEW YORK
City:	
Buffalo	CHARLES J. QUINN, sealer of weights and measures, 757 East Ferry Street.
Rochester	J. H. STEPHENSON, sealer of weights and measures, 34 Court Street.
	MARTIN J. MACK, assistant sealer of weights and measures, 34 Court Street.
White Plains	RICHARD HARDING, sealer of weights and measures, 19 Waldo Avenue.
County:	
Erie	ORAL F. GAYLORD, sealer of weights and measures, 210 County Hall, Buffalo.
Monroe	WILLIAM A. PAYNE, sealer of weights and measures, 305 Terminal Building, Rochester.
	RICHARD STANTON, deputy sealer of weights and measures, 305 Terminal Building, Rochester.
Nassau	ROBERT WILLIAMS, sealer of weights and measures, Courthouse Annex, Mineola.
Suffolk	C. P. SMITH, sealer of weights and measures, Riverhead.
	NORTH CAROLINA
State	WILLIAM A. GRAHAM, commissioner of agriculture, Raleigh.
	C. D. BAUCOM, acting superintendent of weights and measures, Raleigh.
	OHIO
State	J. C. TINKEY, deputy State sealer of weights and measures, Hartman Building, Columbus.
City: Columbus	M. A. BRIDGE, sealer of weights and measures.
County:	
Licking	C. R. MCFADDEN, deputy sealer of weights and measures, Pataskala.
Trumbull	WILLIAM O. WILLIAMS, deputy sealer of weights measures, 802 North State Street, Girard.
	PENNSYLVANIA
State	PHILIP H. DEWEY, secretary of internal affairs, Harrisburg.
	ALBERT B. SMITH, director, bureau of standard weights and measures, Harrisburg.
	L. A. THORNTON, mechanic, department of internal affairs, Harrisburg.
City:	
Allentown	B. FRANK RINN, inspector of weights and measures, City Hall.
Altoona	W. B. DUNN, inspector of weights and measures.
Harrisburg	GEORGE B. NEBINGER, inspector of weights and measures, City Hall.
York	D. L. STOUCH, inspector of weights and measures, 460 West Market Street.

Digitized by Google

County:	
Dauphin	JOHN E. BOWERS, inspector of weights and measures, 13 South Third Street, Harrisburg.
Lehigh	HARRY E. BIERY, inspector of weights and measures, Courthouse, Allentown.
Philadelphia	PHINEAS T. GREEN, chief, bureau of weights and measures, room 308, City Hall, Philadelphia.
	CONYERS B. GRAHAM, chief clerk, room 306, City Hall, Philadelphia.
	WOODWARD ABRAHAMS, district supervisor, bureau of weights and measures, room 305, City Hall, Philadelphia.
	JACOB M. VANDERSLICE, district supervisor, bureau of weights and measures, room 305, City Hall, Philadelphia.
City and County:	
Beaver Falls and Beaver County	CHESTER RIMBY, inspector of weights and measures, Beaver Falls.
Easton and Northampton County	JOHN J. WEPPEL, inspector of weights and measures, Courthouse, Easton.

RHODE ISLAND

City: Providence	JOHN H. HENNESSEY, superintendent of weights and measures.

VERMONT

State	H. N. DAVIS, deputy commissioner of weights and measures, Montpelier.

VIRGINIA

State	J. H. MEEK, director, division of markets, 1030 State Office Building, Richmond.
	H. G. COVILLE, field representative, division of markets, Richmond.
City: Richmond	B. W. RAGLAND, chief, bureau of weights and measures, 314 City Hall Annex.
	C. D. GARDER, deputy sealer of weights and measures, 314 City Hall Annex.

WEST VIRGINIA

State	HOWARD S. JARRETT, commissioner of weights and measures, Charleston.

WISCONSIN

State	GEORGE WARNER, chief inspector of weights and measures, Capitol Building, Madison.
City: Milwaukee	WILLIAM F. STEINEL, sealer of weights and measures, 1331 North Fifth Street.

OTHER DELEGATES, AND GUESTS APPEARING ON THE PROGRAM

BEAN, H. S., Bureau of Standards, Washington, D. C.
BEARCE, H. W., Bureau of Standards, Washington, D. C.
BEATON, CLARENCE V., manager, lubricant division, Shell Eastern Petroleum Products (Inc.), 122 East Forth-second Street, New York, N. Y.
BOUSFIELD, A., chief engineer, E. & T. Fairbanks & Co., St. Johnsbury, Vt.
BRAITHWAITE, W. E., Bureau of Standards, Washington, D. C.
BURGESS, Dr. GEORGE K., Director, Bureau of Standards, Washington, D. C.
CLARK, W. G., chief lubrication engineer, The Pure Oil Co., Chicago, Ill.
FRISBIE, W. S., principal chemist, Food and Drug Administration, United States Department of Agriculture, Washington, D. C.

Digitized by Google

FULLMER, I. H., Bureau of Standards, Washington, D. C.
GOULD, R. E., Bureau of Standards, Washington, D. C.
HARRISON, M. J. J., general scale inspector, Pennsylvania Railroad, Chicago, Ill.
HOLBROOK, F. S., Bureau of Standards, Washington, D. C.
HUBBARD, H. D., Bureau of Standards, Washington, D. C.
JUDSON, L. V., Bureau of Standards, Washington, D. C.
MCCARTY, J. G., Bureau of Standards Master Scale Depot, Clearing Station, Chicago, Ill.
MCLEAN, D. J., superintendent, weights and measures inspection service of Canada, Ottawa, Ontario, Canada.
PARRY, WILLIAM, Bureau of Standards, Washington, D. C.
PEFFER, E. L., Bureau of Standards, Washington, D. C.
PIENKOWSKY, A. T., Bureau of Standards, Washington, D. C.
REGAR, R. S., administrative assistant to Postmaster General, Post Office Department, Washington, D. C.
RICHARD, C. L., secretary, National Scale Men's Association, Bureau of Standards Master Scale Depot, Clearing Station, Chicago, Ill.
RICHARDS, W. S., chairman, standardization committee, Glass Container Association, 965 Wall Street, Toledo, Ohio.
ROESER, H. M., Bureau of Standards Master Scale Depot, Clearing Station, Chicago, Ill.
RUSSELL, H. H., Bureau of Standards Master Scale Depot, Clearing Station, Chicago, Ill.
SMITH, RALPH W., Bureau of Standards, Washington, D. C.
SOUDER, WILMER, Bureau of Standards, Washington, D. C.
SPILMAN, H. A., senior marketing specialist, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.
WEST, Hon. CHARLES, Member of Congress, seventeenth district, Ohio.

GUESTS REPRESENTING MANUFACTURERS OF WEIGHING AND MEASURING DEVICES

American Kron Scale Co.: ERNST OHNELL, president, 422 East Fifty-third Street, New York, N. Y.
Aqua Systems (Inc.): CHARLES F. BECKWITH, president, 2 Lafayette Street, New York, N. Y.
Barnes Scale Co.: W. J. BARNES, president, Detroit, Mich.
Bennett Pumps Corporation: L. A. PRESCOTT, vice president and general manager, Muskegon, Mich.
Black & Decker Manufacturing Co.:
FRED J. TROLL, manager, loadometer department, Towson, Md.
E. E. POWELL, traffic engineer, Towson, Md.
H. L. PRINCE, testing engineer, Towson, Md.
Boe Manufacturing Co.: WALTER H. JOHNSON, vice president, 941 East Hennepin Avenue, Minneapolis, Minn.
Buffalo Meter Co.: H. F. BARRETT, 2917 Main Street, Buffalo, N. Y.
Buffalo Scale Co.: C. G. MENG, 1056 Book Building, Detroit, Mich.
Caille Bros. Co.: T. L. SMITH, general manager, Detroit, Mich.
Chatillon, John, & Sons: P. T. BORTELL, sales manager, 89 Cliff Street, New York, N. Y.
Continental Scale Works: M. J. WEBER, vice president, 5701 South Claremont Avenue, Chicago, Ill.
Dover Stamping & Manufacturing Co.: LOUIS S. CLEAVES, vice president and sales manager, Cambridge, Mass.
Exact Weight Scale Co.: JOHN G. SIMS, vice president, 944 West Fifth Avenue, Columbus, Ohio.
Fairbanks, E. & T., & Co.: A. BOUSFIELD, chief engineer, St. Johnsbury, Vt.
Fairbanks, Morse & Co.: C. A. HENNIE, manager, scale department, 115 East Lombard Street, Baltimore, Md.
Ferro Machine & Foundry Co.: E. W. KEWITZ, 3155 East Sixty-sixth Street, Cleveland, Ohio.
Gilbert & Barker Manufacturing Co.:
G. C. ROBERTS, sales manager, Springfield, Mass.
W. A. WALKER, eastern district manager, Springfield, Mass.
A. L. GUITERSON, sales engineer, Springfield, Mass.

Digitized by Google

Hazel-Atlas Glass Co.:
A. T. GARDEN, sales department manager, Wheeling, W. Va.
EVERETT S. GREER, plant superintendent, Zanesville, Ohio.
Hersey Manufacturing Co.:
WILLIAM H. FARROW, chief engineer, 381 E Street, South Boston, Mass.
WINTHROP P. HERSEY, assistant secretary, 381 E Street, South Boston, Mass.
Howe Scale Co.: C. A. LINDSAY, branch manager, 415 Arch Street, Philadelphia, Pa.
International Business Machines Corporation:
J. C. MILNER, sales manager, 270 Broadway, New York, N. Y.
S. M. TEMPLETON, vice president and sales manager, Dayton Scale Co. division, Dayton, Ohio.
H. S. EVANS, Washington manager, 816 Fourteenth Street, Washington, D. C.
W. G. EGEETON, sales agent, 816 Fourteenth Street, Washington, D. C.
Jacobs Bros. Co. (Inc.):
H. M. JACOBS, secretary and treasurer, 32 Walton Street, Brooklyn, N. Y.
JOHN E. WOODLAND, sales manager, detectogram division, 32 Walton Street, Brooklyn, N. Y.
Jennings, O. D., & Co.: G. F. HALEY, director, 4309 West Lake Street, Chicago, Ill.
Kellogg Manufacturing Co.: J. K. GILCHRIST, sales promotion manager, 97 Humboldt Street, Rochester, N. Y.
L N S Corporation:
HARRY T. GOSS, president, 71 Murray Street, New York, N. Y.
BJORNULF JOHNSEN, secretary, 71 Murray Street, New York, N. Y.
Ludlow Valve Manufacturing Co.: WILLIAM H. LOLLEY, president, Troy, N. Y.
Merit Equipment Corporation:
A. L. WERTZ, president and general manager, 6616 Morgan Avenue, Cleveland, Ohio.
E. W. ALLINGTON, eastern representative, 135 East Forty-second Street, New York, N. Y.
Moore & Kling (Inc.): ELMER M. KLING, treasurer, 221 High Street, Boston, Mass.
National Pipe Products Corporation: LYON MCCANDLESS, chief engineer, Rochester, Pa.
National Store Specialty Co.: W. E. FINCH, chief engineer, Bareville, Pa.
National Vending Corporation: H. C. TURNER, president, 876 Maccabee Building, Detroit, Mich.
Neptune Meter Co.: R. K. BLANCHARD, vice president, 50 East Forty-second Street, New York, N. Y.
Oil Products Appliance Co.: J. T. GOSSETT, vice president, 17 Battery Place, New York, N. Y.
Owens-Illinois Glass Co.: PAUL MULLER, New York manager, 11 Park Place, New York, N. Y.
Peerless Weighing Machine Co.:
NEAL W. FOSTER, assistant to the president, 245 Fifth Avenue, New York, N. Y.
E. M. SCHIEMER, 245 Fifth Avenue, New York, N. Y.
Pittsburgh Equitable Meter Co.:
W. H. PARKER, assistant chief engineer, Pittsburgh, Pa.
HORACE CHRISMAN, engineer, Pittsburgh, Pa.
J. A. FORSYTHE, Pittsburgh, Pa.
Roy Manufacturing Co.: FRANK J. OLDFIELD, vice president, 230 Water Street, Quincy, Mass.
Rush Manufacturing Corporation: JOSEPH H. RUSH, Lafayette, Ind.
Screw Machine Specialty Co.:
R. P. SUESS, 7721 Susquehanna Street, Pittsburgh, Pa.
J. W. WELCH, 7721 Susquehanna Street, Pittsburgh, Pa.
Seederer-Kohlbusch (Inc.): EDWIN C. SMITH, sales manager, Jersey City, N. J.
Seraphin Manufacturing Co.: THEO. A. SERAPHIN, president, 1314 North Seventh Street, Philadelphia, Pa.
Sharpsville Boiler Works Co.: CHARLES D. FAGAN, president, Sharpsville, Pa.
Sheffler Bros.: EARL RITZERT, distributor, 2121 New York Avenue, Washington, D. C.
Standard Computing Scale Co.: M. D. RIBBLE, vice president in charge of sales, Detroit, Mich.

Digitized by Google

Tokheim Oil Tank & Pump Co.:
CHESTER C. OBERLY, sales manager, Fort Wayne, Ind.
W. M. FRAZIER, district manager, Maryland Trust Building, Baltimore, Md.
Toledo Scale Co.:
CHARLES C. NEALE, special representative, Toledo, Ohio.
FRANK J. DAVIS, Toledo, Ohio.
Triner Scale & Manufacturing Co.: JAMES C. EDGERTON, agent, 1395 National Press Building, Washington, D. C.
Universal Lubricating Systems (Inc.): WILLIAM P. FARRELL, treasurer, 919 Fulton Building, Pittsburgh, Pa.
Universal Pump & Tank Corporation: CHARLES SPAETH, treasurer, 2860 East Ninety-first Street, Cleveland, Ohio.
Wayne Co., The:
A. D. CARRIGER, vice president, 30 East Forty-second Street, New York, N. Y.
A. P. HITZEMAN, chief engineer, Fort Wayne, Ind.
C. B. HARWELL, district manager, 4030 North Broad Street, Philadelphia, Pa.
M. C. BROWN, salesman, 608 American Building, Baltimore, Md.
Worthington Pump & Machinery Corporation:
FRANK W. HANKINS, merchandising manager, Harrison, N. J.
ROBERT J. WARD, Harrison, N. J.

GUESTS REPRESENTING TRADE ASSOCIATIONS

American Petroleum Institute: PAUL E. HADLICK, secretary, division of marketing, 250 Park Avenue, New York, N. Y.
Glass Container Association:
VICTOR L. HALL, 19 West Forty-fourth Street, New York, N. Y.
W. S. RICHARDS, chairman, standardization committee, 965 Wall Street, Toledo, Ohio.

GUESTS REPRESENTING BUSINESS AND INDUSTRY

BABOR, RUD J., technical director, Richfield Oil Corporation of New York, 122 East Forty-second Street, New York, N. Y.
BAKER, B. E., Standard Oil Co. of New York, 230 Park Avenue, New York, N. Y.
BARTRAM, A. M., Shell Eastern Petroleum Products (Inc.), 122 East Forty-second Street, New York, N. Y.
BEATON, C. V., manager, lubricant division, Shell Eastern Petroleum Products (Inc.), 122 East Forty-second Street, New York, N. Y.
BOHART, J. G., Sinclair Refining Co., 45 Nassau Street, New York, N. Y.
BOYD, PAUL C., Atlantic Refining Co., 260 South Broad Street, Philadelphia, Pa.
CLARK, W. G., chief lubricating engineer, The Pure Oil Co., Chicago, Ill.
DAVIS, W. L., sales manager, Crown Cork & Seal Co., Baltimore, Md.
ELGAR, QUESTED L., Standard Oil Co. of New York, 26 Broadway, New York, N. Y.
FRENCH, G., Sinclair Refining Co., 45 Nassau Street, New York, N. Y.
GALLAGHER, BERT L., sales promoter, Standard Oil Co. of New Jersey, 15 Washington Street, Newark, N. J.
HASKELL, RAYMOND, industrial engineer, The Texas Co., 135 East Forty-second Street, New York, N. Y.
KELLER, C. W. Jr., purchasing agent, Sherwood Bros. (Inc.), 1430 Baltimore Trust Building, Baltimore, Md.
KERNS, F. C., superintendent, lubricating sales, The Texas Co., 135 East Forty-second Street, New York, N. Y.
LYONS, JOHN F., supervisor weights and measures, American Stores Co., 421 West Nineteenth Street, Philadelphia, Pa.
SAYBOLT, J. W., sales manager, Standard Oil Co. of New Jersey, 26 Broadway, New York, N. Y.
SHARP, J. E., vice president and general manager, Aluminum Seal Co., New Kensington, Pa.

GUESTS REPRESENTING RAILROADS AND WEIGHING DEPARTMENTS

DEAN, T. O., superintendent of scales, Texas & Pacific Railway, Dallas, Tex.
EDWARDS, C. R., supervisor of scales and work equipment, Wabash Railway Co., Decatur, Ill.

Digitized by Google

EPRIGHT, A. W., superintendent scales and weighing, Pennsylvania Railroad, Altoona, Pa.
GOE, R. B., supervisor weighing and inspection, Illinois Central System, Chicago, Ill.
HARRISON, M. J. J., general scale inspector, Pennsylvania Railroad, Chicago, Ill.
HICKS, B. L., supervisor of weights, Western Weighing and Inspection Bureau, 1800 Transportation Building, Chicago, Ill.
HOSFORD, C. C., general scale inspector, Pennsylvania Railroad, room 1015, Pennsylvania Railroad Station, Pittsburgh, Pa.
KLOTZ, WILLIAM G., superintendent of scales, Missouri Pacific Lines, 204 Union Station, Houston, Tex.
LAWRENCE, E. KENT, general scale inspector, Baltimore & Ohio Railroad, B. & O. Central Building, Baltimore, Md.
MACGREGOR, GEORGE B., assistant scale inspector, Delaware & Hudson Railroad Corporation, Albany, N. Y.
MACRITCHIE, A. D., supervisor of scales and weighing, Grand Trunk Railroad Co., Battle Creek, Mich.
PETTIS, C., general scale inspector, New York Central Railroad, N. Y. C. Railroad Station, Rochester, N. Y.
TATE, H. A., general scale inspector, Norfolk & Western Railway, Roanoke, Va.
TAYLOR, JOHN E., chief inspector, weighing bureau, Chesapeake & Ohio Railway, Richmond, Va.
WELSH, R. C., general scale inspector, Pennsylvania Railroad, Harrisburg, Pa.
ZEIBEL, A. G., scale inspector, American Bridge Co., Ambridge, Pa.

GUESTS REPRESENTING GOVERNMENT DEPARTMENTS

CAREY, L. C., marketing specialist, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.
FRISBIE, W. S., principal chemist, Food and Drug Administration, United States Department of Agriculture, Washington, D. C.
HARING, JOHN W., superintendent, division of post-office scales, Post Office Department, Washington, D. C.
REGAR, R. S., administrative assistant to Postmaster General, Post Office Department, Washington, D. C.
SMITH, W. W., assistant superintendent, division of post-office scales, Post Office Department, Washington, D. C.
SPILMAN, H. A., senior marketing specialist, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.

OTHER GUESTS

BELANGER, S. F., standards adjuster, weights and measures inspection service of Canada, Ottawa, Ontario, Canada.
JACOBS, EDITH G., secretary, Scale Journal Publishing Co., 7152 Ridgeland Avenue, Chicago, Ill.

Digitized by Google

CONTENTS

First Session (Morning of Tuesday, June 2, 1931)

	Page
Opening address by the president, Dr. George K. Burgess	1
Abstracts of State reports:	
Arizona, D. P. Kimball	7
California, J. S. Casey	7
Connecticut, Louis Elsner	8
District of Columbia, George M. Roberts	8
Florida, Howard E. Crawford	8
Georgia	8
Illinois, W. T. Fossett	8
Indiana, I. L. Miller	8
Maine, C. V. Fickett	9
Maryland, S. T. Griffith	9
Massachuetts, John D. Brummitt	9
Michigan, L. P. Strong	9
Minnesota, D. F. Jurgensen	9
Missouri, W. H. Hubele	10
Nevada, S. C. Dinsmore	10
New Hampshire, H. A. Webster	10
New Jersey, Joseph G. Rogers	10
New York, Charles J. Quinn	10
North Carolina, C. D. Baucom	11
Ohio, J. C. Tinkey	11
Pennsylvania, Albert B. Smith	11
Rhode Island	11
Announcement	11

Second Session (Afternoon of Tuesday, June 2, 1931)

Abstracts of State reports—Continued:	
Vermont, H. N. Davis	12
Virginia, J. H. Meek	12
West Virginia, Howard S. Jarrett	12
Wisconsin, George Warner	12
Abstracts of reports of representatives of State associations of weights and measures officials:	
California Weights and Measures Association, Thomas Flaherty	13
Illinois Weights and Measures Association, W. A. Carleton	13
Indiana Association of Inspectors of Weights and Measures, I. L. Miller	13
Maine State Sealers' Association, C. V. Fickett	13
Massachusetts Association of Sealers of Weights and Measures, John D. Brummitt	13
Michigan State, County, and City Sealers' Association, George F. Austin, jr	14
Minnesota Association of Inspectors of Weights and Measures	14
New Jersey Weights and Measures Association, Joseph G. Rogers	14
New York Association of Sealers of Weights and Measures, C. P. Smith	14
Ohio State Sealers Association, C. R. McFadden	14
Pennsylvania Association of Inspectors of Weights and Measures, Albert B. Smith	14
Virginia Weights and Measures Association, B. W. Ragland	15
Wisconsin Weights and Measures Association, George Warner	15

Digitized by Google

Page

Lubricating-oil bottles:
The viewpoint of the bottle manufacturer, by W. S. Richards, chairman, standardization committee, Glass Container Association of America 15
Methods of merchandising motor oil in sealed bottles:
Paper of W. G. Clark, chief lubrication engineer, Pure Oil Co ... 16
Paper of C. V. Beaton, manager, lubricant division, Shell Eastern Petroleum Products (Inc.) 20
Drainage characteristics of lubricating-oil bottles of various types, by F. S. Holbrook, Bureau of Standards 22
Report of committee on specifications and tolerances on modification of specifications and tolerances for lubricating-oil bottles, presented by F. S. Holbrook, chairman 27
Discussion of above report 28

Third Session (Morning of Wednesday, June 3, 1931)

Equipment for testing large-capacity meters for petroleum products, by Charles M. Fuller, city and county sealer of weights and measures, Los Angeles, Calif 41
State requirements for net-content marking of packages other than food packages, by Howard S. Jarrett, commissioner of weights and measures, State of West Virginia 42
Proposed consolidation and amendment of Federal standard-container legislation, by H. A. Spilman, senior marketing specialist, Bureau of Agricultural Economics, United States Department of Agriculture 44
Discussion of above paper 59
Remarks of Hon. Philip H. Dewey, secretary of internal affairs, State of Pennsylvania 61
The administration of weights and measures in Canada, by E. O. Way, director, weights and measures inspection service, Department of Trade and Commerce of Canada 61
The extension of weights and measures supervision, by Ralph W. Smith, Bureau of Standards 72
Remarks by Hon. Charles West, Member of Congress, seventeenth Ohio district 77
Necessity of a code of regulations for commercial weighing and measuring devices 83
Appointment of committees 85

Fourth Session (Afternoon of Wednesday, June 3, 1931)

Tour of the laboratories of the Bureau of Standards 86

Fifth Session (Morning of Thursday, June 4, 1931)

Demonstration of scales embodying new design features 87
Discussion following demonstration by manufacturers 89
Supplying copies of paper of Ralph W. Smith 90
Report of committee on specifications and tolerances on a code of regulations, presented by F. S. Holbrook, chairman 91
Discussion of above report 92
The supervision of post-office scales, by R. S. Regar, administrative assistant to the Postmaster General, and purchasing agent, Post Office Department 97
The development of large-capacity scales, by A. Bousfield, chief engineer, E. & T. Fairbanks & Co 99
The sealer's responsibility relative to person-weighing scales, by William O. Williams, deputy sealer of weights and measures, Trumbull County, Ohio 106
Motion to reconsider adoption of code of regulations 111
Demonstration of person weighers 111

Digitized by Google

Sixth Session (Afternoon of Thursday, June 4, 1931)

Page

Report of committee on specifications and tolerances on specifications, tolerances, and regulations for person weighers, presented by F. S. Holbrook, chairman ... 113
Discussion of above report ... 114
Announcement concerning the seventh session ... 122
Wheel weighers on highways, by L. P. Strong, chief, division of weights and measures, State of Michigan ... 123
Gages and gaging, by I. H. Fullmer, Bureau of Standards ... 125
New equipments for testing large-capacity scales:
Paper of I. L. Miller, commissioner of weights and measures, State of Indiana ... 130
Discussion of above paper ... 133
Paper of W. A. Payne, sealer of weights and measures, Monroe County, N. Y ... 133
Discussion of above paper ... 136
Remarks of Francis Meredith, director of standards, State of Massachusetts ... 136
Discussion of above remarks ... 136
General consideration of subjects of interest and questions brought up for discussion by officials:
Liquid measures of nonstandard sizes ... 137
Lubricating-oil bottle of improper type ... 138
Two meters in one housing for dispensing different grades of gasoline ... 138

Seventh Session (Morning of Friday, June 5, 1931)

Report of committee on specifications and tolerances on specifications and tolerances for odometers, and on miscellaneous items relative to other codes, presented by F. S. Holbrook, chairman ... 140
Discussion of above report ... 140
Supplementary report of committee on specifications and tolerances in relation to regulation No. 2 for liquid-measuring devices, presented by F. S. Holbrook, chairman ... 147
Factors involved in large-capacity weighing, by M. J. J. Harrison, general scale inspector, Pennsylvania Railroad ... 147
The itinerant scale mechanic, by DeForest McLin, sealer of weights and measures, Huntington County, Ind ... 154
Discussion of above paper ... 158
Net-content marking of packages under Federal food and drugs act, by W. S. Frisbie, principal chemist, Food and Drug Administration, United States Department of Agriculture ... 158
The present status of standard-weight bread legislation, by F. S. Holbrook, Bureau of Standards ... 162
Discussion of above paper ... 168
Current activities of National Scale Men's Association, by C. L. Richard, secretary, National Scale Men's Association ... 168
Report of committee on uniformity in weights and measures requirements ... 171
Report of committee on nominations, presented by H. S. Jarrett, chairman, and election of officers ... 171
Report of committee on resolutions, presented by C. D. Baucom:
In memory of William F. Cluett ... 172
In memory of A. W. Schwartz ... 172
In memory of J. Harry Foley ... 173
Provision of place for seal on scales ... 173
Appreciation to E. O. Way and D. J. McLean ... 173
Appreciation to Hon. Charles West ... 173
Appreciation to the director and staff of the Bureau of Standards ... 173
Indorsement of activities of National Scale Men's Association ... 173
Appreciation to the press ... 174
Appreciation to the management of the Mayflower Hotel ... 174
Discussion of above report ... 174
Report of the treasurer, George F. Austin, jr ... 175
Wreath in memory of Louis A. Fischer ... 175
Motion in relation to expenditures ... 176
Fixing of time and place of next meeting ... 176

Digitized by Google

APPENDIXES

Page

Appendix I.—Specifications and tolerances for lubricating-oil bottles, as amended by the Twenty-fourth National Conference on Weights and Measures, June 2, 1931 ---------- 178

Appendix II.—Tentative specifications, tolerances, and regulations for person weighers, adopted by the Twenty-fourth National Conference on Weights and Measures, June 4, 1931 ---------- 179

72155°—31——2

Digitized by Google

Digitized by Google

Digitized by Google



Official photograph of delegates and guests attending the Twenty-fourth National Conference on Weights and Measures, assembled at the entrance of the East Building, National Bureau of Standards

Digitized by Google

REPORT OF THE TWENTY-FOURTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

HELD AT THE BUREAU OF STANDARDS, WASHINGTON, D. C., JUNE 2–5, 1931

FIRST SESSION (MORNING OF TUESDAY, JUNE 2, 1931)

The conference was called to order at 10.58 o'clock a. m., by Dr. George K. Burgess, president of the conference.

OPENING ADDRESS BY THE PRESIDENT, DR. GEORGE K. BURGESS

It is always with the greatest pleasure that I welcome to Washington and to the Bureau of Standards the delegates and guests attending this conference. I am particularly pleased this year that so many of you are able to be present. In this year of rather heavy trials it is very satisfactory to see that the activities in weights and measures, as represented by this gathering, are being carried out in the same spirit of cooperation that has always been in evidence in the past.

It has been customary for your presiding officer in his opening address to call attention to the activities of Congress with respect to weights and measures legislation. At the past session of Congress very little was done in that field. There were no bills relating to weights and measures introduced since the twenty-third conference on weights and measures.

Of the bills mentioned at the last meeting, two passed—House bill 730 and Senate bill 108. These are now known as Public No. 538 and No. 325, respectively.

The former is in relation to canned food and is an amendment to the national food and drugs act. It is made unlawful for canned food to fall below the standards of quality, condition, or fill of container, promulgated by the Secretary of Agriculture, unless it is plainly indicated on the package that such canned food falls below such standard. This law will be discussed on Friday, when Doctor Frisbie, of the United States Department of Agriculture, will address the conference on that subject.

Public No. 325 relates to the suppression of unfair and fraudulent practices in the marketing of perishable agricultural commodities in interstate and foreign commerce, and embraces fruits and vegetables of every kind and character.

The following laws relating to bureau activities may be of interest to the conference:

Digitized by Google

Public, No. 219 provides for a hydraulic laboratory at the bureau. Before closing my talk this morning I will tell you something about that laboratory, which is just being established.

Public, No. 414 provides for the purchase of approximately 11 acres of land to enlarge the grounds of the bureau. That purchase has been made; the land acquired is to the north and west of the bureau.

Public, No. 700 authorizes the acquisition of land, not exceeding 200 acres, and buildings and equipment for the propagation and reception of radio signals.

I may say in this connection that the work of the radio section can not be carried out in its entirety on the bureau grounds because, on the one hand, certain radio signals interfere with other work going on and, on the other, other activities we carry on here interfere with some kinds of radio work. So provision is to be made for two new stations, one for continuous sending of standard frequency signals, the other for experimental research on radio phenomena.

We are interested in this conference in the matter of accuracy and tolerances and it may be of some interest to you to know the extreme accuracy which we are able to attain in the radio field. It may surprise some of you to learn that the primary standards of frequency maintained at the bureau are kept constant and controlled to one or two parts in ten millions, which is perhaps as high a degree of accuracy as is obtained in practically any work, equivalent to one two-hundred-and-fifty-thousandth of an inch on a yardstick. Our secondary standards, which are used in connection with this control work, are kept in a condition of constancy almost, if not quite as good, as our primary standards.

Your presiding officer has now to report the death, since our last conference, of three of its very active and distinguished members.

William F. Cluett, chief deputy inspector of weights and measures of the city of Chicago, Ill., who for many years has been a member of the conference committee on specifications and tolerances, passed away on October 16, 1930. Last year he was not able to be present on account of his illness. We will all remember Mr. Cluett as a most thorough and conscientious worker and fearlessly efficient, and we all regret his passing.

A. W. Schwartz, assistant superintendent of weights and measures of New Jersey, who also was a member of the conference committee on specifications and tolerances, died January 12, 1931. Mr. Schwartz, you will remember, was also a very active worker in the conference and was always very ready to take a most helpful part in matters under discussion.

Within the last few weeks has occurred another death in the State organization of New Jersey, that of J. Harry Foley, State superintendent of weights and measures, who passed away on May 22, 1931. Mr. Foley, you will remember, was a past vice president and treasurer of this conference. I am sure the conference will extend its sympathy to the families of these coworkers of ours by suitable resolutions.

I have made appointments to fill the vacancies on the committee on specifications and tolerances. The new members are Joseph G. Rogers, assistant State superintendent and secretary of the New

Digitized by Google

Jersey department of weights and measures, and William A. Payne, sealer of weights and measures of Monroe County, N. Y. Both of these gentlemen have participated in the deliberations of the committee this year.

The program which has been arranged by the executive committee for this meeting promises to be an excellent one. This afternoon you will note that attention is to be given to the subject matter of lubricating-oil bottles. On Wednesday morning we have a very fine program of a general nature, at which we expect to have the honor of an address by the Secretary of Commerce, Mr. Lamont. Also, we expect to be addressed by Congressman West, of Ohio. For the first time a representative of the Canadian Government will be in attendance; he will talk to us on the question of "The Administration of Weights and Measures in Canada." You will recall that we have had speakers and delegates from outlying districts, such, for example, as Porto Rico several years ago, but I believe this is the first time that an independent country has sent its own representative to talk to us.

Thursday will be largely devoted to the subject of scales and weighing. There will be several papers and the question of person-weighing scales will come up. Interest has been evidenced in this subject at the past two sessions of the conference, you will remember, and I believe this year the subject matter will be brought into more systematic condition than it has been hitherto, through the introduction of a code of specifications and tolerances for these machines.

It may be of some value to the members of the conference if I mention some of the publications of particular interest from a weights and measures standpoint that have been issued by the bureau during the year.

First is the Report of the Twenty-Third National Conference on Weights and Measures, Miscellaneous Publications, Bureau of Standards, No. 116. That was issued some time ago and you should all have received it.

Then we have Circular of the Bureau of Standards No. 386, Specifications for the Manufacture and Installation of Railway Track Scales for Light Industrial Service. That is of obvious interest.

We have the Annual Report of the Director of the Bureau of Standards, Miscellaneous Publication No. 115, which contains a summary of the bureau's activities, and also the Standards Yearbook, 1931, Miscellaneous Publication No. 119. In the last-named publication an endeavor is made to give a picture not only of the activities in this country in relation to standardization, but the activities in foreign countries as well. The special subject matter in the yearbook for this year deals with standardization in transportation.

We have also a publication covering standard thicknesses, weights, and tolerances of sheet metal, as well as a specification for plain and thread plug and ring gage blanks, and also American national standard screw thread tables for shop use—coarse and fine thread series, and special screw threads.

The bureau has also been concerned with the question of time zones and we have published a chart setting forth the actual location of the time zones of the country. The time zones, although originally designed to be straight, so to speak, nevertheless in practice have

Digitized by Google

become quite irregular, so that it is of some importance to have available the actual delimitation of these zones.

At the last conference your chairman mentioned certain general international activities. You will recall that the international committee on weights and measures is charged with the function of unifying practices throughout the world, the international committee being set up by a treaty to which the United States subscribed. This international committee held a meeting last April, and among the matters considered was whether 20° C. (68° F.) should be the normal standard temperature for shop-standard practice in the use of gages. That is of very considerable importance from the point of view of international exchange of gages on the one hand and manufactured products on the other, because of the exactness of the work being carried out in a good many of our shops to-day. It has been the custom in this country to use 68° F., while 62° F. was the customary temperature employed in England. As a result, Mr. Johannson, who is a maker of gages as you all know, had a practice of making his gages slightly different for England than for the United States.

In the history of this project Germany and the United States agreed at once that 68° F. or 20° C. should be the normal temperature at which such lengths should be standard. Then France agreed to this temperature, but England demurred. However, in April England agreed to come in, and the international committee then passed the resolution to make 20° C. or 68° F. uniform throughout the world. Consequently all the countries are now in agreement as to an industrial inch being an inch at 68° F. (20° C.).

Under the jurisdiction of the International Committee on Weights and Measures also come matters relating to electrical standards. At this last meeting of the committee the work of the subcommittee, set up some years ago to define more exactly the electrical units and standards, was considered and their activity was approved. This bureau proposed through this subcommittee that there be set up a new standard of light. This standard was first suggested by this bureau some twenty-odd years ago, but due to experimental difficulties the project had not been completed until within about a year. This standard up to the present time has been based on electric lamps which were hoped to remain constant, but we are not quite sure of this. The standard which we hope may be approved at the next meeting of the committee is based on light emitted through an opening of a certain area in a black body from platinum at its freezing point. That standard is absolutely constant, reproducible, convenient to operate, and inexpensive. If this standard is accepted, we will then have for light a standard which can be put into universal use.

It may be of interest to you to know that in connection with the work on standards relating to temperature scales and electrical units there is now going on an interchange between the German National Laboratory and this bureau. In connection with experimental work Doctor Henning, of the German laboratory, has been spending some two months with us on this question of light on the one hand and temperature scales on the other. The temperature scales in the lower region are based on the use of what we call platinum resistance thermometers. They are very sensitive and can indicate temperature

Digitized by Google

to 0.001 of a degree. The agreement between the German laboratory, the British laboratory, and this bureau is now on the order of one or two hundred-thousandths of a degree from the lowest up to the ordinary temperatures. Then for the higher ranges thermocouples of platinum and an alloy of rhodium and platinum are used, and the current generated can be very exactly measured. The electromotive force generated is used as a measurement of temperatures, and thereby temperatures can accurately be measured up to about 2,500° F. The agreement of the various laboratories should be better than one-tenth of a degree. For the very high temperatures light radiation is used. The highest temperature used as standard is the melting point of platinum, and that is known to an accuracy of about 1 degree.

Thus now on the complete temperature scale from the lowest possible to the highest measurable, the several national laboratories are in substantial agreement.

While Doctor Henning has been here we have sent one of our men, Mr. Vinal, to Europe to effect an intercomparison of electrical units. We also have a proposed standard of X-ray dosage by physicians. This has been a rather troublesome matter; the apparatus formerly suggested has not been portable, and the disagreement in the laboratories has been quite serious. Mr. Taylor, of the bureau, has now devised an apparatus, which he has taken abroad with him, that is only about one-fifteenth the size of the previous apparatus and of greater reproducibility. We hope this standardization apparatus for X-ray measurement will soon come into more common use.

Last year I mentioned several lines of research that were in progress at the Bureau of Standards. This year I will emphasize more particularly the testing work of the bureau. This work of testing covers a very wide field of apparatus and material. The total number of items tested during the last fiscal year was 200,726, having a fee value of nearly $684,000, so that is a substantial part of the activities of the bureau.

A few of the items which are of some interest to this group may be mentioned: On items connected with gages and gage steels we made 2,714 tests; on miscellaneous dimension items, 5,169; on weights and balances, 7,869; on scales, 1,097; on volumetric apparatus, 15,155; on hydrometers, 1,131; and we made 477 density determinations. We started last year a new type of testing, namely, airplane engines for the aircraft industry. Each manufacturer of a new type of engine, before he can market it, has to submit it to a test at the bureau under stated conditions. We tested some 46 new aircraft engines during the past year.

The radium testing is continuing and 1,240 radioactive materials have been tested. That is an interesting type of work in that the packages of radium coming into this country are sold only on Bureau of Standards certificate of radium content of the radium salts. This is eliminating confusion on the one hand and uncertainty and disputes on the other. Similarly we maintain for distribution several hundred samples of chemical materials which we call our standard chemical samples. These samples are made up, analyzed, and distributed to interested parties. These material standards are widely

Digitized by Google

used and prevent a great deal of controversy which might otherwise occur.

I will not read the total list of tests, but might mention one or two other items: On cement, concreting materials, and similar items we made 12,070 tests; on miscellaneous ceramic materials, 2,311 tests; on rubber, 1,429; on textiles, 6,933; on paper, 1,785; and so on. As I have mentioned, the total list amounts to over 200,000 items. Provisions have been made for you to visit the laboratories on Wednesday afternoon and you will see some of this testing work being carried on.

During the present fiscal year we will have tested over 1,000 track scales, and the work of calibrating track scale test cars at the master scale at Clearing, Ill., has been very active and effective. I might also state that the new track scale car which we have ordered is to be delivered next month. That will replace our first car, which is now some 18 years old.

In view of the fact that we have a rather long program, it will perhaps be as well if I do not go into further details. I might mention, however, that the cement reference testing laboratory has served very effectively. You may recall that two years ago I called your attention to the fact that this facility was about to be set up to check the testing-cement laboratories of the country, of which there are some 300. We have now checked some 200 of those laboratories and brought them into line from the point of view of uniformity of test and accuracy of their test equipment. This service is of very great importance to the cement industry and the public. Similarly we have started calibrating engineering testing machines and plan this coming year to take a survey of the country from the point of view of accuracy and agreement. Thus, in these two fields—of cement and of testing machines used in engineering—we expect to be able to be on a basis of very much greater uniformity than has been the case in the past.

Two of the rather new pieces of equipment in the bureau are the circular dividing engine and the circle-testing machine for circles used by the geodetic survey and the surveying fraternity. We were requested to rule and test several circles furnished by the Coast and Geodetic Survey. We did this work on our machines and they were mounted on instruments and used in the field. After a time the results obtained seemed to be somewhat inaccurate and it appeared that the circles were to blame. The whole matter was investigated and we think we have run down the trouble. It was not due to error in graduating the circles or to error in measuring the circles, but was due to the fact that the metal of which they were made did not stay constant. The result was that the circles were changing their shape, and consequently the instruments gave progressively different results. We were working to an accuracy of 1 second.

During the past year at the suggestion of the Secretary of Commerce there has been set up what is known as the Federal Fire Council, which has for its object bringing together those responsible for the Government buildings, to function in an advisory and informative capacity on matters relating to protection against fire hazards. Probably before we get through we shall arrange a code for use both from the construction point of view and the operating point

Digitized by Google

of view. This council has held several meetings and has made surveys of Government occupancy of a considerable number of buildings in Washington, with very gratifying results. Through the aid of the American Fire Protective Association surveys are now being made of several of the Federal prisons from the point of view of better protection.

Before closing I am going to say a few words about our newest activity in the Bureau of Standards which is just getting under way—the new hydraulic laboratory. Some of you may have noticed to the south a rather large excavation which has been made in the side of the hill. That is the location of the new laboratory. By using models of various kinds and streams of water under definitely controlled conditions which can be measured, definite studies of water flow can be made, and this is of very great importance in connection with dams, jetties, spillways, and rivers and harbors work. Often engineers have different designs prepared for structures, and it is not immediately apparent which is the most economical on the one hand and most efficient on the other. Frequently data obtained in studies such as are mentioned above will help in the solution; thus this laboratory is designed to answer those questions for the engineers. This hydraulic laboratory will be finished next March, so when you come here next year you may be prepared to see a new building on the bureau grounds.

That, gentlemen, completes the general remarks that I have to make in opening this conference.

ABSTRACTS OF STATE REPORTS[1]

ARIZONA

By D. P. KIMBALL, *Sealer of Weights and Measures, Phoenix*

Mr. Kimball explained that inasmuch as this was the first conference which he had attended he was not accustomed to the form of report usually presented. He was in attendance to obtain information to help in the prosecution of weights and measures work.

CALIFORNIA[2]

By J. S. CASEY, *Chief, State Division of Weights and Measures*

Mr. Casey expressed appreciation of the effective support rendered by the Bureau of Standards to the weights and measures organization in his State. He cited the necessity of cooperation of the various organizations with each other and to this cooperation attributed the remarkable advances made. He predicted continued improvement in apparatus and in the testing methods of the officials.

[1] For convenience of reference these reports have been arranged in alphabetical order throughout.

[2] This report was submitted through Thomas Flaherty and was read to the conference by him.

Digitized by Google

CONNECTICUT

By LOUIS ELSNER, *Sealer of Weights and Measures, Hartford*

Mr. Elsner explained that Mr. Pilon, State inspector of weights and measures, had been incapacitated for a considerable time on account of a long illness. However, weights and measures inspection work in Connecticut had been progressing very satisfactorily through the efforts of the local sealers during this period.

DISTRICT OF COLUMBIA

By GEORGE M. ROBERTS, *Superintendent of Weights, Measures and Markets, Washington, D. C.*

Mr. Roberts reported that Congress had made an appropriation to purchase a large truck to be equipped and utilized in the testing of large-capacity scales in the District of Columbia. This piece of equipment was one the necessity of which had been recognized for some time.

FLORIDA

By HOWARD E. CRAWFORD, *Inspector of Weights and Measures, Jacksonville*

Mr. Crawford reported the establishment of a city department of weights and measures in Jacksonville some months ago. He cited the deplorable condition in which some apparatus was found on first inspection and also the results of a package reweighing survey. He explained that an economy program caused the failure to pass a State weights and measures law at the last session of the legislature.

GEORGIA

(An official was in attendance from Georgia, but no report from the State was presented to the conference.)

ILLINOIS

By W. T. FOSSETT, *State Superintendent of Standards*

Mr. Fossett explained that this year marked the tenth anniversary of the foundation of the Illinois department and briefly outlined the progress made during that time. He noted the fact that a suitable laboratory had been provided for the test of new types of devices which were being submitted in increasing numbers. During the past year especial stress had been laid upon the reweighing of package goods to safeguard the buying public during the depression. A State association was organized during the year.

INDIANA

By I. L. MILLER, *State Commissioner of Weights and Measures*

Mr. Miller reported the completion of an equipment for the testing of large-capacity scales. He also noted that the standard-weight bread law was being attacked in the Federal courts. A law requiring

Digitized by Google

that duplicate tickets be issued for each sale of coal showing gross, tare, and net weights had been recently enacted at the instance of the coal dealers.

MAINE

By C. V. Fickett, *Sealer of Weights and Measures, Portland*

Mr. Fickett stated that on account of the size of his State it had been found possible to make but little progress toward securing a state-wide inspection of commercial weighing and measuring devices.

MARYLAND

By S. T. Griffith, *Chief, Division of Weights and Measures, Baltimore*

Mr. Griffith reported the introduction of two bills in the legislature, one requiring the sale of all commodities by weight, and the other providing for a state-wide inspection of gasoline pumps. Neither bill was enacted into law, although they were more favorably received than formerly. He reported the fact that Baltimore was meeting success in its weights and measures administration; in only three other counties in the State was any inspection work being done.

MASSACHUSETTS

By John D. Brummitt, *Sealer of Weights and Measures, Danvers*

Mr. Brummitt reported that there was being built by the State an equipment designed for the testing of large-capacity scales up to a capacity of 20 tons.

MICHIGAN

By L. P. Strong, *Chief, State Division of Weights and Measures*

Mr. Strong explained that the work in his State was progressing as usual. He took the opportunity to express his appreciation for the cooperation of the Bureau of Standards, both through correspondence and through the attendance of a representative at the meetings of the State association.

MINNESOTA

By D. F. Jurgensen, *Chief Engineer, Minnesota Railroad and Warehouse Commission*

Mr. Jurgensen explained the working of a law passed about two years ago providing for the testing of electricity and water meters upon the filing of a petition by a number of users and the deposit of a sum covering part of the cost of the test. About 16 per cent of the electricity meters inspected had been condemned as inaccurate; the majority of these were found in favor of the consumer. There was no demand for the testing of water meters.

Digitized by Google

MISSOURI

By W. H. HUBELE, *Commissioner of Weights and Measures, St. Louis*

Mr. Hubele expressed his opinion that the most important work being done by his department was the regulation of coal deliveries through a system of bonded weighers and coal tickets issued by the city. This ordinance had been upheld by the State Supreme Court. He reported surveys of gasoline deliveries and of packages of foodstuffs; he also noted a large increase in complaints in regard to the domestic deliveries of fuel oil.

NEVADA

By S. C. DINSMORE, *State Sealer of Weights and Measures*

Mr. Dinsmore reported the passage of a public weighmaster act which had proven very popular, had the support of many large dealers, and was working out successfully; another recently enacted law provided for gasoline inspection. He stated that under the provisions of the State law the specifications adopted at the conference automatically went into force in Nevada. The department recently added to its equipment for the testing of large-capacity scales.

NEW HAMPSHIRE

By H. A. WEBSTER, *State Commissioner of Weights and Measures*

Mr. Webster reported that especial attention had been given to the enforcement of specifications for apparatus, particularly the code for grease-measuring devices and the specification requiring visi-gauges on gasoline pumps. Satisfactory compliance had now been brought about. Other activities included the reweighing of commodities put up in the stores, the inspection of coal and wood deliveries, and the enforcement of the net-weight law.

NEW JERSEY

By JOSEPH G. ROGERS, *Assistant State Superintendent of Weights and Measures*

Mr. Rogers reported the recent deaths of J. Harry Foley, State superintendent, and of A. W. Schwartz, and paid a tribute to their memory. He summarized the recent activities of the department in relation to approval of type of apparatus, especially gasoline meters, grease-dispensing devices, lubricating-oil bottles, and scales. He also noted a number of special investigations carried on. A law was enacted requiring the weighing of coal deliveries by certified weighmasters.

NEW YORK

By CHARLES J. QUINN, *Sealer of Weights and Measures, Buffalo*

Mr. Quinn gave a brief résumé of the weights and measures organization of the State and of the inspection work accomplished in his city. He also explained the activities of the State department which makes annual surveys covering sales of coal and gasoline, and other-

Digitized by Google

wise checks the work of the local officials. He referred to the success attending the meetings of the State association of weights and measures officials.

NORTH CAROLINA

By C. D. BAUCOM, *Acting State Superintendent of Weights and Measures*

Mr. Baucom explained the efforts made in his State to support the department by means of a fee system and later by means of a franchise tax on manufacturers, neither of which worked out in a satisfactory manner. At the last session of the legislature both of the earlier laws were repealed and the work was put upon an appropriation basis. The new law provides that the specifications adopted by the conference automatically take effect in the State; approval of type of apparatus is also provided for.

OHIO

By J. C. TINKEY, *Deputy State Sealer of Weights and Measures*

Mr. Tinkey reported that the State was now enforcing a regulation forbidding the use of scales having a beam and poise not in sight of the customer. He stated that the code for grease-measuring devices was now being enforced. Some confusion exists in the State in relation to the fee system which is now being enforced in several counties and the bread law, which was recently declared unconstitutional in respect to tolerances in excess.

PENNSYLVANIA

By ALBERT B. SMITH, *Director, State Bureau of Standard Weights and Measures*

Mr. Smith reported that the code of specifications for grease-measuring devices had been adopted and these devices were now subject to serialization under the State law. A bill was passed by the State legislature which legalizes the short ton of 2,000 pounds for the sale of anthracite coal instead of the long ton of 2,240 pounds formerly required; this was now in the hands of the governor for approval.

RHODE ISLAND

(An official was in attendance from Rhode Island, but no report from the State was presented to the conference.)

ANNOUNCEMENT

The CHAIRMAN. Gentlemen, if it is your pleasure, we will adjourn for lunch, but before adjournment, the secretary has an announcement to make. Mr. Holbrook.

Mr. HOLBROOK. Mr. Chairman, I desire to say that copies of the Report of Committee on Specifications and Tolerances on Modification of Specifications for Lubricating-Oil Bottles are now available for distribution on my table. That report will come up this afternoon.

The CHAIRMAN. The conference will stand recessed until 2 o'clock.

(At this point, at 1 o'clock p. m., the conference took a recess until 2 o'clock p. m.)

Digitized by Google

SECOND SESSION (AFTERNOON OF TUESDAY, JUNE 2, 1931)

The conference reassembled at 2.17 o'clock p. m., Howard S. Jarrett, first vice president, in the chair.

ABSTRACTS OF STATE REPORTS—Continued

VERMONT

By H. N. Davis, *Deputy State Commissioner of Weights and Measures*

Mr. Davis reported the promulgation of the code of specifications for grease-measuring devices and of the specification requiring the use of visigauges on gasoline-dispensing units. He also reported the passage of two new laws by the legislature; the first has to do with the sealing of standards, the second regulates the sale of paint and requires that it be labeled. The reweighing of maple sirup and the checking of commodities had had special attention during the year.

VIRGINIA

By J. H. Meek, *Director, State Division of Markets*

Mr. Meek described the organization of the weights and measures administration in his State with particular reference to financial cooperation with the various jurisdictions so that the system of inspection was gradually being expanded to cover all sections of the State. A special effort had been made to require packages to be marked with their net contents; cooperation had been procured with other jurisdictions and gratifying results had been obtained.

WEST VIRGINIA

By Howard S. Jarrett, *State Commissioner of Weights and Measures*

Mr. Jarrett laid particular stress on the importance of coal-mining operations and on the testing of mine scales in the State. Since the mines were not operating at full capacity and wages received were consequently smaller there had been received an increasing number of serious complaints in regard to the accuracy of the scales used in weighing the output of the various workers. It had been found possible to handle these complaints in a satisfactory manner and disputes had largely been avoided.

WISCONSIN

By George Warner, *Chief State Inspector of Weights and Measures*

Mr. Warner reported that a bill designed to protect the station operator from being charged for shrinkage of gasoline was intro-

Digitized by Google

duced in the legislature but was not enacted. The department had been active in making "try outs" of service stations through purchasing gasoline delivered to a "dummy" tank on an automobile, and, as a result of experience, he strongly recommended this method of combating short-measure deliveries.

ABSTRACTS OF REPORTS OF REPRESENTATIVES OF STATE ASSOCIATIONS OF WEIGHTS AND MEASURES OFFICIALS

CALIFORNIA WEIGHTS AND MEASURES ASSOCIATION

By THOMAS FLAHERTY, *Sealer of Weights and Measures, San Francisco*

Mr. Flaherty reported that the State and local sealers of California had held a very successful weights and measures conference.

ILLINOIS WEIGHTS AND MEASURES ASSOCIATION

By W. A. CARLETON, *State Inspector of Standards*

Mr. Carleton reported the formation of a State association in December, 1930. As a result of this it had already been found that closer cooperation existed between the State and local officials and that the work of inspection in some of the smaller jurisdictions was being stimulated. The membership of officials was now between 40 and 50.

INDIANA ASSOCIATION OF INSPECTORS OF WEIGHTS AND MEASURES

By I. L. MILLER, *State Commissioner of Weights and Measures*

Mr. Miller reported the constructive nature of the meetings of the Indiana association and noted the cooperation extended by the Bureau of Standards in having a representative present at the meetings. The next meeting of the association will be held in the latter part of June.

MAINE STATE SEALERS' ASSOCIATION

By C. V. FICKETT, *Sealer of Weights and Measures, Portland*

Mr. Fickett reported that the Maine association experienced difficulty in assembling the local officials of the State at the meetings on account of the large size of the State. As a result the progress being made by the association was slow, but it was doing the best work possible under the circumstances.

MASSACHUSETTS ASSOCIATION OF SEALERS OF WEIGHTS AND MEASURES

By JOHN D. BRUMMITT, *Sealer of Weights and Measures, Danvers*

Mr. Brummitt noted that the Massachusetts association was the oldest association of weights and measures officials in the country, having held 36 conferences. There was a fine spirit of cooperation manifest among the State director and his inspectors and the local officials. The next convention will be held at Westfield, and Mr. Brummitt extended an invitation to those in attendance.

Digitized by Google

MICHIGAN STATE, COUNTY, AND CITY SEALERS' ASSOCIATION

By GEORGE F. AUSTIN, Jr., *Supervising Inspector of Weights and Measures, Detroit*

Mr. Austin stated that the next convention of the Michigan association would be held next September at Grand Rapids, a constructive program had been arranged, and a cordial invitation was extended to all in attendance to visit their meeting.

MINNESOTA ASSOCIATION OF INSPECTORS OF WEIGHTS AND MEASURES

(An official was in attendance from Minnesota, but no report of the activities of this association was given at the conference.)

NEW JERSEY WEIGHTS AND MEASURES ASSOCIATION

By JOSEPH G. ROGERS, *Assistant State Superintendent of Weights and Measures*

Mr. Rogers reported that the New Jersey association was accustomed to hold two meetings a year, one in the summer at which officials, equipment manufacturers, and other guests were regularly present; the other in winter, which was limited to officials only, and at which the legislative program was discussed. The next meeting will be held in Atlantic City early in September to which everyone was invited.

NEW YORK ASSOCIATION OF SEALERS OF WEIGHTS AND MEASURES

By C. P. SMITH, *Sealer of Weights and Measures, Suffolk County*

Mr. Smith briefly reviewed the accomplishments of the last meeting of the New York association and cited some of the principal subjects which were discussed. He noted that this meeting was very well attended and was a very successful one. He invited everyone to attend the next meeting which would be held in July at Canton.

OHIO STATE SEALERS' ASSOCIATION

By C. R. MCFADDEN, *Deputy Sealer of Weights and Measures, Licking County*

Mr. McFadden explained the organization of the Ohio association which functioned somewhat differently than those in other States. A regular annual meeting is held in December in Columbus. Additional district meetings are held frequently throughout the year which are attended by State department representatives and by the local officials of the district in question. At these meetings decisions are reached as to what apparatus should be sealed and thus uniformity of action is fostered.

PENNSYLVANIA ASSOCIATION OF INSPECTORS OF WEIGHTS AND MEASURES

By ALBERT B. SMITH, *Director, State Bureau of Standard Weights and Measures*

Mr. Smith stated that at the last convention held by the Pennsylvania association 130 persons were in attendance, the program was

Digitized by Google

very good, and keen interest was manifested. The next convention will be held in the city of Allentown and it was hoped to equal or surpass the successful meetings of the past.

VIRGINIA WEIGHTS AND MEASURES ASSOCIATION

By B. W. RAGLAND, *Chief, Bureau of Weights and Measures, Richmond*

Mr. Ragland stated that the Virginia association was not functioning at the present time.

WISCONSIN WEIGHTS AND MEASURES ASSOCIATION

By GEORGE WARNER, *Chief State Inspector of Weights and Measures*

Mr. Warner explained that formerly it was the practice to hold State conferences, but for several years these have been omitted and smaller sectional meetings in various parts of the State have been held instead. It is the intention again to revive the state-wide meetings and it is expected that a conference will be held during the coming year.

The ACTING CHAIRMAN. The next items on our program refer to the general subject of Lubricating-Oil Bottles. You will recall that the question of lubricating-oil bottles has been receiving much attention during the past year by bottle manufacturers, oil distributors, weights and measures officials, and the Bureau of Standards. There appears to have been a certain amount of misunderstanding among these various groups, and the developments of the year have made it advisable for the conference committee on specifications and tolerances to recommend to you some modification of your present code for lubricating-oil bottles.

The importance of this subject and the widespread interest which it has aroused indicate the desirability of this conference hearing and considering the views of all interested groups, after which it is to be anticipated that such misunderstandings as may exist at present will be eliminated.

LUBRICATING-OIL BOTTLES

THE VIEWPOINT OF THE BOTTLE MANUFACTURER

By W. S. RICHARDS, *chairman, standardization committee, Glass Container Association of America.*

Mr. Chairman and gentlemen, as a representative of the Glass Container Association of America and chairman of its standardization committee, I have with me to-day representatives of the manufacturers of glass containers, also of metal closures. We feel that we have definite ideas as applied to containers for lubricating oil; in fact, we came here to present certain views. We find what appears to be a tentative recommendation by a committee of the conference making revisions in the code of regulations which has prevailed for the past year. Now I do not think it is fair for me to stand here and take the time of this meeting to outline or to go into details of

Digitized by Google

the glass container for lubricating oil. I would much prefer to leave that to the discussion that will come later. We do want to say this, and say it very definitely, that the glass-container manufacturers of this country have cooperated to the fullest extent, and intend to cooperate, to make the glass container for lubricating oil, which has come to stay, comply with the requirements that may be set down either by the Federal regulations or the State laws. Thank you very much.

The ACTING CHAIRMAN. We come now to that angle of the question which can best be discussed by the people actually distributing their product in the bottles which are under consideration. Several oil distributors were invited to describe their marketing methods and demonstrate the type of bottle used; two companies accepted this invitation, the Pure Oil Co. and the Shell Eastern Petroleum Products (Inc.).

METHODS OF MERCHANDISING MOTOR OIL IN SEALED BOTTLES

PAPER OF W. G. CLARK, CHIEF LUBRICATION ENGINEER, PURE OIL CO.

Mr. Chairman, members of the conference, and guests, the adoption of the sealed-bottle idea for merchandising motor oil has become of increasing interest to weights and measures officials during the past year or two. Since oil bottles were the subject of a resolution of the twenty-third national conference last year, we believe that the reason for the adoption of this type container, so far as our company is concerned, and the methods used in its handling, should be of further interest especially to those members of the conference who are not entirely familiar with it.

The Pure Oil Co. has long recognized deficiencies in the present methods of dispensing motor oils in bulk to customers, both at service stations and at retail dealers. Most current methods utilize a measuring device of some kind, either a calibrated bottle or a metal measure. The deficiency of these methods, so far as insurance to the public against short measure is concerned, lies in the fact that responsibility for accurate measure and delivery of oil to the customer rests entirely in the hands of the service station attendant and is subject to his possible dishonesty or carelessness.

In addition to this human element the measures used for oil at service stations are required by most State regulations to have a calibration or fill line on them, indicating, in the case of quart measures, a volume of one quart. However, oil is a viscous fluid and sticks to the interior surface of a measure or container to a varying degree, depending on the temperature and body of the oil. In every case oil will adhere to the container so that if the measure is initially filled to a capacity of exactly one quart, less than a quart can be delivered from it in the time normally consumed by such an operation in service-station practice. This deficiency in delivery will vary from 2 to 4 per cent, depending on conditions, which means that the customer receives less than he pays for to the extent of 2 or 4 per cent.

Since most of the motor oil purchased by the motorist is handled in this manner, it means a large amount of deficiency in the aggregate, both in oil and money. The oil company, however, does not profit by this short measure to customers since the service-station attendant may be fully aware of the condition and take advantage

Digitized by Google

of it for his personal profit. He knows the approximate amount of this short measure and by keeping record of his transactions and by checking his inventory of oil in the bulk tank he can sell the accumulated excess, pocket the money, and still check out perfectly with the company auditor.

As said before the Pure Oil Co. has long deplored this condition and has sought for a means to correct it. This was difficult, since in most States the regulations would not permit the use of any measures except of the type referred to above. The obvious solution, therefore, lay in the development of a sealed container, the contents of which could be measured before placing in the package and enough extra oil added so that a full quart could be delivered.

The company engineers experimented for three years with a variety of metal and glass containers, and finally, after much labor and expense, developed the present Tiolene bottle, which is exhibited here to-day. A clear glass container offers distinct advantages from a sales standpoint over opaque containers. It displays the oil well, shows its color, and is its own gage glass in showing the customer when the container is empty.

This particular bottle is small enough in diameter to be easily grasped in the hand, and is also small enough so that light will pass through the oil, which helps in detecting substitution, due to the readily recognizable color and cast of our premium oil. In large-diameter bottles all oils are more or less opaque and appear very similar. The small diameter of this bottle, its length, and the large opening in the neck, together with the generous air space above the oil level, make this bottle pour very easily and quickly and retain a minimum of oil.

Another of the great evils of present methods of oil dispensing is that of substitution. We have had our share of this trouble and it is one of the main factors influencing us in the development of this bottle. You are well aware how substitution is practiced, and how difficult it is to prevent, even at well-supervised stations, especially when oils of more than one quality and price are dispensed in bulk by the usual methods. Substitution of one oil for another prevented us from carrying more than one-price oil at our service stations. This was detrimental to our business as we could not satisfy all classes of trade with one oil. The use of the sealed container for our premium-grade oil allows us to carry two oils in stock with a negligible chance of substitution. The color of our premium Tiolene oils and our other motor oils is sufficiently different that we can detect substitution of one for the other in this slender bottle. It would be impossible in a thicker and shorter bottle in which all oils look more or less alike.

The special opener we use was developed to destroy the cap at the time it is removed from the bottle. This opener punctures the cap and so distorts it that it can not be replaced. All service station operators and dealers are required to use this opener.

We feel that the assistance of this bottle in preventing substitution is alone a sufficient justification for its use. The bottle is filled at company-operated bulk plants and is received at the service stations sealed, so that the responsibility for the contents rests with the Pure Oil Co. and not with a possible irresponsible service-sta-

Digitized by Google

tion attendant. The service-station attendant or dealer opens the bottle seal in the presence of the customer and then usually pours the oil into the customer's car. Our advertising asks the customer to insist on this point and to refuse any bottle that has been opened or tampered with before he sees it. If a customer wants oil to take away with him without putting it into his engine, it is customary to sell him a sealed metal container, charging him for the container and the oil.

This bottle is a sealed container, the amount and quality of the contents being controlled by the Pure Oil Co. and not by the service-station operator. Herein lies the big difference between this container and the ordinary oil measure or measuring bottle which is filled by the service-station operator, at the service station, with practically no supervision.

The oil is placed in our bottles by means of a distinct and separate measuring device, and the quantity delivered to the bottle is not in any way determined by the capacity of the bottle. The filling and measuring device will deliver the same quantity by each operation, whether it is to one of these bottles or any other container. There is nothing in the way these bottles are handled to indicate that there is the slightest intention to consider the bottles as a measure.

The pumps and filling machines used at the Pure Oil Co. plants for filling these bottles are accurately adjusted to pump the exact amount necessary into each bottle to insure that a full quart can be delivered from the bottle. These pumps, in most instances, have been checked and sealed by the State or local sealer, and our plant superintendents also make frequent checks of their accuracy. They are accurate measures, subject to any or all regulations pertaining to such devices. They are adjusted to throw approximately 3 per cent over 1 quart, which is more than sufficient to permit the delivery of a full quart from every bottle without using any more time for draining than is ordinarily used with other bottles or with measures.

Because this bottle is merely a dispensing and transporting medium, and is not used as a measure, no fill line is put on the bottle. The nature of the contents are indicated by the words "Tiolene motor oil" blown in the glass and the quantity shown by the words, "Contents when sealed sufficient to deliver one liquid quart," also blown in the glass, with the Pure Oil Co. name below it.

Fill lines on bottles are inaccurate at best, since bottles even from the same mould will vary in thickness of glass and hence in their interior capacity. This means that a fill line placed at a uniform height on a bottle will indicate a variable quantity. The quantity of oil in our bottle is independent of variations in manufacture, since the contents are measured by an accurate pump or filling machine before being placed in the bottle.

Dealers to whom this sealed service is extended must sign agreements binding them to use these bottles only as we direct. They are also under constant supervision of our salesmen, tank-wagon drivers, and inspectors who are on the lookout for possible substitution and mishandling. Please bear in mind that no one is authorized to fill these bottles except the Pure Oil Co. or its subsidiaries.

Digitized by Google

You can see from the above that these bottles are handled strictly as sealed containers or transporting units and are not in any sense used like the ordinary Rhodes type of oil-measuring bottle which is filled and refilled by the service station attendant or dealer. In addition to our supervision, which we have found adequate to date, our advertising requests the customer to reject bottles when the seals are not removed in the customer's presence. We also have a signed contract with every dealer in which he agrees not to refill the bottle or to use it for any other purpose.

We believe that this bottle, as we handle it, is a true sealed container, even though common trade practice in dispensing oil necessitates the emptying of the container rather than selling it as a unit. Although the contents are dispensed into customers' cars, this is common trade practice for this commodity, so that comparisons with sealed containers or sealed packages of other commodities should be judged from the viewpoint of common trade practice for the specific commodity.

In Ohio the question arose with the department of weights and measures as to whether or not our bottle was a measure or a container and it was submitted by the director of agriculture to the attorney general of Ohio for decision. The attorney general rendered a decision at length in answer to the director of agriculture's request, from which I quote in part as follows:

> In view of the conclusions reached by me, the bottles described by you in your letter are not liquid measures, or bottles used for the sale of lubricating oil within the meaning of the regulations of the director of agriculture, nor is a person putting up such bottles, where the contents are sold without the bottle, required to comply with the provisions of section 13128, General Code. (This is the section of the Ohio General Code that refers to packages.) I am, therefore, of the opinion that the use of the bottles in the manner indicated by you is not in violation of law.

We have quoted from this decision merely to remove any misunderstanding which has arisen in some cases over bottles of this type and use. This misunderstanding, we believe, is due to the somewhat ambiguous wording of the regulations in many States regarding lubricating-oil bottles. This wording usually begins as follows: "Bottles used for the sale of lubricating oil," which can be interpreted as meaning all bottles, whereas it must be obvious that regulations of a weights and measures department are intended only for weights and measures devices and can be validly applied only to weights and measures devices. This regulation would have been clearer if it had read, "Measuring bottles used for the sale of lubricating oil."

The very wide use of sealed packages and containers proves that the public want their merchandise in that form. The day of the open cracker barrel is gone and there is even more reason why oil should be handled in a sealed container than many other commodities. The average car owner can rarely tell one oil from another by looking at them. This makes substitution of an inferior product much easier than in the cases of other commodities. Therefore, any means which tends to assure the purchaser of getting the genuine article that he wants is worthy of employment and should merit the approval and enlist the cooperation of weights and measures officials generally.

Digitized by Google

We have used this plan of merchandising oil for about two years, and its instant success and approval has shown us that the motoring public appreciates what we are trying to do in their interest and has well repaid us, at least in good will, for our investment. However, the plan is so new that it is still largely experimental, and the large investment in equipment will necessarily restrict its wide use.

Other oil companies have now adopted similar plans and we are confident that weights and measures officials everywhere will give them their best of cooperation, since after all, the sealed bottle idea is intended primarily to carry out the very purpose for which departments of weights and measures are instituted, namely, the protection of the public.

PAPER OF C. V. BEATON, MANAGER, LUBRICANT DIVISION, SHELL EASTERN PETROLEUM PRODUCTS (INC.)

Mr. Chairman, delegates, and visitors, during the latter part of 1930 the Shell companies in America decided to market a Shell brand of pure Pennsylvania motor oil in addition to their regular line of lubricants to meet the requirements of customers who prefer a motor oil of this type.

It is the intention of the Shell companies to market this Pennsylvania oil on a premium price basis, and every effort has been made to produce a product possessing the finest quality and specifications in its particular class. In placing this premium type motor oil on the market they were faced with the fact that during recent years a certain amount of publicity had been given to the fraudulent substitution of branded motor oil by some unreliable resellers. Therefore, in order to protect the consumer and eliminate any doubt of the genuineness of the product in the minds of the motoring public, it was decided by the management of the Shell Eastern Petroleum Products (Inc.) in the East and the Shell Petroleum Corporation in the Middle West to retail the Shell-Penn motor oil in sealed containers.

A thorough investigation was made of the various types of sealed containers available for this purpose, such as cans, fiber containers, and glass bottles. The bottle-dispensing method was finally accepted as the most satisfactory, for the reason that it appears to be the only system of marketing a premium-priced motor oil, which meets the requirements for visibility and convenience of handling and positively guarantees protection against substitution to the purchaser. In addition it provides a clean and attractive method of dispensing the product, which in itself increases consumer acceptance.

As soon as the method of distribution was decided upon we consulted F. S. Holbrook, secretary of the National Conference on Weights and Measures, for complete information covering the latest code requirements applying to sealed-bottle containers for motor-oil dispensing. We then started a search for the most suitable type of bottle and found two of them already in use by other marketers, neither of which, however, appeared to meet the requirements of the code adopted last year by the National Conference on Weights and Measures.

As it was our desire to develop a bottle that would meet the requirements of the 1930 code in every way and also, if it were at all

Digitized by Google

possible, prove acceptable as a measure in all States in which we operate, the heads of the departments of weights and measures in the various States were contacted for definite information on the laws and regulations governing glass containers for motor-oil dispensing. While the regulations in the majority of States were based upon or closely approximate the requirements of the national code, several of the States and cities possessed laws or ordinances that made it somewhat difficult for us to devise a glass container of standard type that would prove acceptable as a measure in all States and cities throughout the territory in which we operate.

We finally succeeded in perfecting a bottle which we feel conforms in all respects to the national code, with the exception of the vent, which is, of course, impossible to provide in a sealed container made wholely of glass. In our opinion the vent is unnecessary, as it serves no useful purpose.

The bottle is 14½ inches high, 3 inches in width, and weighs about 28 ounces. The neck of the bottle is so designed that the contents will not pour until the bottle is practically in a horizontal position, thus permitting easy pouring of the oil directly into the fill pipe of the motor. In addition to the company's name and trade-mark and the brand name of the product, there is also blown into the glass, at the base of the neck of the bottle a line one-tenth of an inch in width, designating the full quart level. Beneath this line are the words "Liquid contents 1 quart" and an arrow pointing vertically to the line with the inscription "Fill to line." The bottle also bears the manufacturer's name near the bottom, and on the breast are the words "Look for refiner's cap—it must correspond."

Lubricating oils, of course, are subject to expansion and contraction by changes in temperature, and it was deemed advisable, in order to avoid any questions arising as to the contents of the bottles, to make suitable allowance for this by filling them 3 per cent in excess of the full quart. A fine line has been blown into the neck of the bottle, above the full-quart mark, to designate the point to which they should be filled during the bottling operation, in order to provide for the desired excess tolerance. This extra quantity of oil also compensates for the small amount that clings to the inside surface of the bottle, thus assuring the customer of receiving the quantity purchased.

Vertical ribs about three-sixteenths of an inch in width and about half an inch apart provide a good hand grip and tend to reduce breakage of bottles in handling. These ribs also serve to strengthen the container.

The caps used by the Shell Eastern Petroleum Products (Inc.) for sealing the bottles after filling are of the Goldy type and are manufactured from aluminum, with a metal disk and cork gasket, and when properly applied with a suitable capping machine will hold an internal pressure of 35 to 40 pounds per square inch. These caps bear the company's name, the grade of oil contained in the bottle, and the SAE viscosity number of the same. The contents of the bottle can not be removed without destroying the sealing cap, thus eliminating the possibility of substitution.

The bottles are filled only at the company's own terminals. All empty bottles are drained on special conveyors and then carefully

Digitized by Google

cleansed internally and externally in washing machines and thoroughly drained and inspected prior to refilling. The filling operation is performed with pumps that are adjusted to deliver 3 per cent in excess of a full quart. After capping, the bottles are distributed in light steel carrying crates, which hold 16 bottles each. These carrying crates are also sealed prior to shipment with a special wire seal.

A number of people have already raised the question as to why we do not market all of our motor oil in the sealed glass containers. The answer to this is the additional cost involved. While we are not prepared to give any definite figures at the present time on the actual cost of dispensing motor oil in bottles, in comparison with the conventional method, we have found during the short time that we have employed the sealed-bottle system that the additional cost is quite considerable. We are of the opinion, however, that this additional cost is worth while in marketing a premium priced product, in view of the added protection it gives to the consumer and ourselves.

I take this opportunity of extending to Mr. Holbrook and the executive committee my company's sincere thanks for the opportunity given us to address you on this occasion. Also to thank the directors of the departments of standards, weights, and measures in the various States and cities, whom we have contacted, for the consideration and cooperation given us while working out the various problems concerning the bottling of our oil.

DRAINAGE CHARACTERISTICS OF LUBRICATING-OIL BOTTLES OF VARIOUS TYPES, BY F. S. HOLBROOK, BUREAU OF STANDARDS

As you have noted, lubricating-oil bottles occupy an important place on the program of this conference. This is for the reason that new methods and apparatus for the sale of lubricating oil are rapidly developing, much interest has been manifested in the matter during the year just passed, and the subject is one that is pressing for solution. It was naturally desired that action should be taken only when all the pertinent facts were in mind, and therefore interested parties have been given the opportunity of presenting their viewpoints to you.

In following out this general course of procedure my function is to give you the results of an investigation on lubricating-oil bottles which the Bureau of Standards has conducted during the past year.

This investigation was occasioned by the fact that two requirements in the code of specifications have largely engaged the attention of those interested in the general subject, and definite data on their necessity were lacking. The first concerns the maximum height requirement for the bottles. A number of bottles on the market exceed the height restrictions contained in the present conference code, which—it may be mentioned in passing—was included before the tall all-glass bottles were developed; the second concerns the necessity from a weights and measures standpoint of the vent which is now required by the code. That requirement was also included before the advent of the all-glass bottle, which is the type in which it is difficult to incorporate this feature.

There seemed to be considerable confusion and difference of opinion as to the propriety of these requirements. Consequently, in order to

Digitized by Google

clarify the situation and gain authoritative data upon the various types—their merits and demerits from a weights and measures standpoint—the weights and measures division of the Bureau of Standards procured bottles of the various types in use and made a study of their drainage characteristics by determining the quantities of oil retained in the bottle at various periods after delivery was begun. One or two types very recently appearing have been studied in the same way, so that the information has been kept up to date. This information has been made available to the committee on specifications and tolerances and has been used by it in reaching the conclusions that will shortly be presented to you in specification form.

Now let us consider the types of bottles included in the investigation.

(At this point the speaker exhibited and described the bottles which were included in the investigation. For the purposes of the record they may be described as follows:

No. 1. Black band, 9¼-inch bottle, with detachable metal spout, equipped with long vent pipe extending nearly to bottom of bottle.

No. 2. Red band, 8½-inch bottle, with detachable metal spout, with short vent in base of spout.

No. 3. Green band, 14½-inch all-glass bottle, neck diameter 1 inch, no vent.

No. 4. Narrow black band, 14½-inch all-glass bottle, neck diameter 1¼ inches, no vent.

No. 5. Brown band, 18-inch all-glass bottle, neck diameter three-fourths inch, no vent.

No. 6. Purple band, 18-inch all-glass bottle, neck diameter 1⅛ inches, no vent.)

The manner in which the data were collected may be described as follows: The bottle under investigation was filled with 1 quart of a medium grade of lubricating oil, at ordinary room temperature. The contents were then discharged by first tilting the bottle to an angle of about 60° until the flow started, after which it was upended vertically. The oil flowed out in a virtually solid stream until the bottle was nearly empty, when the stream broke down into what may be described as a trickle flow. The delivery was immediately halted at this point and it was determined how much oil remained in the bottle when this breakdown of the flow took place. The time elapsing from the beginning of the delivery to this breakdown of the flow was noted by a stop watch. These figures determine the first point plotted on the drainage curve for the bottle in question. (See fig. 1.)

The bottle was refilled with oil and a delivery made as before except that this time the oil was allowed to flow for a predetermined period which was longer than before; that is, after the main flow broke down the trickle flow was allowed to continue for some seconds before the delivery was stopped and the oil retained in the bottle measured. The length of this period, and the amount of oil retained, fix the position of the second point on the drainage curve for this bottle.

This process was repeated several times, each time the period from the beginning of the delivery to the measurement of the amount retained being lengthened until it reached 60 seconds, at which time the experiments were discontinued on this bottle.

Each of the above determinations was repeated three times and the average value was used so that accidental errors of manipula-

Digitized by Google

tion and observation would be avoided. All determinations were made by weight instead of by measure for the obvious reason that while the measurement of the oil retained would have been a difficult task and a relatively inaccurate one at best, the weight method was both speedy and accurate. The tare weight of the bottle and the weight per unit volume of the oil having once been established, the amount of oil adhering to the sides of the bottle at any time was determined by the weighing of the bottle in its condition at that time, the difference between this weight and the tare weight obviously being the weight of the retained oil. This figure was then translated into terms of measure.

On the graph (fig. 1) a continuous line of a certain character represents the results obtained on a certain bottle. Distances measured horizontally from the left-hand side of the graph represent the number of seconds elapsing from the start of the delivery of 1 quart of lubricating oil. The elapsed times are shown on the scale along the bottom of the chart. Distances measured vertically from the base line of the chart represent the amounts of oil retained in the bottle according to the scale of cubic inches shown on the left-hand edge of the chart. The several lines sloping downward and to the right show graphically the speed of delivery of the oil from the various bottles.

It results from the method of plotting the graphs that the more nearly vertical the line representing the delivery the faster the oil is being delivered; the more nearly horizontal the line the slower the oil is being delivered. At the end of the 60-second period the line is nearly horizontal, indicating that the rate of delivery is almost zero; that is, the amount being delivered is very small at that time in all cases.

By comparing the characteristics of the deliveries from the bottles of various types, one with another, the comparative efficiency with which each performs its function can be determined. By comparing the deliveries from one type in which a special feature is incorporated with the deliveries from types not embodying this feature, the advantages or disadvantages of the type are disclosed. For our present purposes the deliveries from bottles with vents and from bottles without vents can be studied; also the behavior of bottles of differing heights can be observed.

In the light of the data gained we may first consider the necessity of a vent from a weights and measures standpoint: There is no question that a vent speeds up the delivery of the bulk of the oil in the bottle—the main flow breaks down to a partial flow more quickly when a vent is provided than would otherwise be the case. In the case of bottle No. 1 the main flow breaks down into a trickle flow sooner than in the case of any other bottle tested, the period being 5 seconds after the start of the delivery; in the case of bottle No. 2 the period is 7 seconds, and only one out of the four bottles not vented has a shorter period. When the vents on these two bottles were closed and the experiment was repeated the periods increased to 16 seconds and 35 seconds, respectively.

However, it is not believed that the speed of operation of the device is of particular importance from a strict weights and measures standpoint—rather, this consideration is of importance from the

Digitized by Google

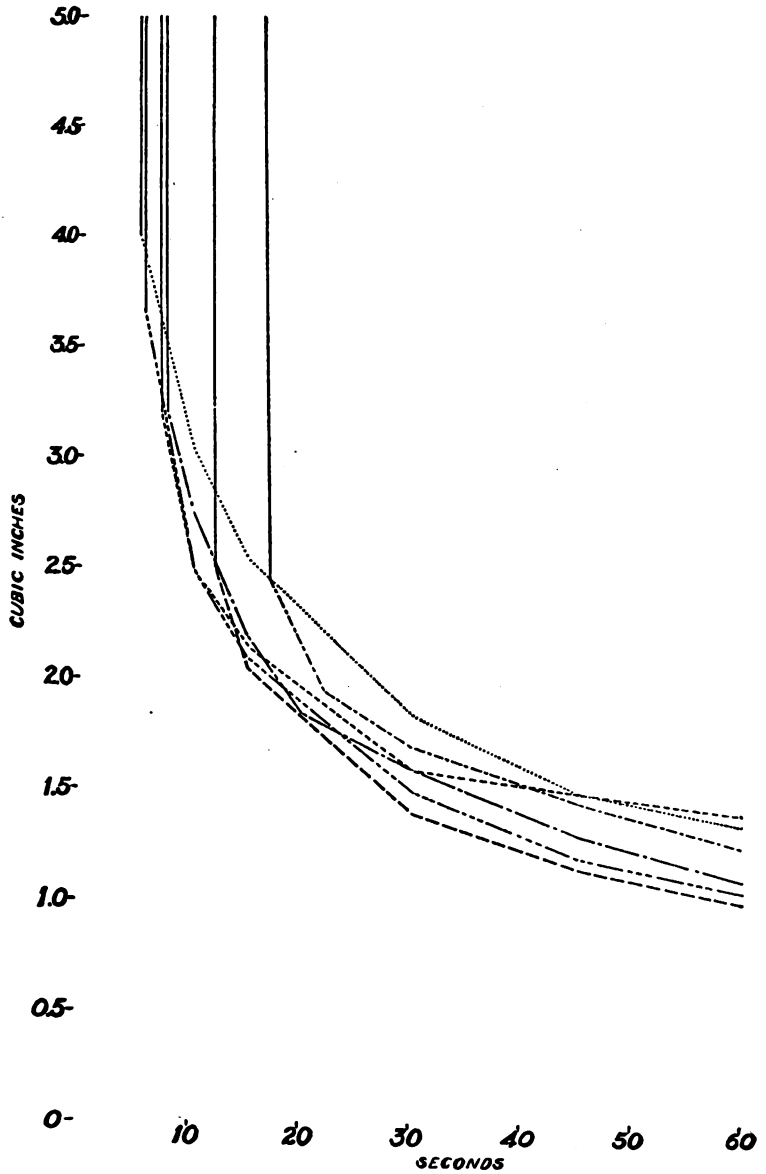


FIGURE 1.—*Drainage characteristics of lubricating-oil bottles*

. . . . . , metal spout, long vent (No. 1).
- - - - - - - - - - - - - - , metal spout, short vent (No. 2).
— — — — — — — — , all glass, 14½ inches tall, neck diameter 1 inch (No. 3).
- - - —— - - - —— , all glass, 14½ inches tall, neck diameter 1¼ inches (No. 4).
—— · —— · —— , all glass, 18 inches tall, neck diameter ¾ inch (No. 5).
—— — —— , all glass, 18 inches tall, neck diameter 1⅛ inches (No. 6).

Digitized by Google

standpoint of merchandising. Speed of delivery would only be of weights and measures interest if as a result of slow delivery the operation were likely to be interrupted before completion and a portion of the measured oil were to be retained as a result. One might suppose that this would ordinarily be the case. But consider how these bottles are used. They are upended in the crank case of the motor vehicle and the delivery commences. It seems obvious that it is not convenient to withdraw the bottle and stop the flow until after the main flow has broken down to a trickle flow. To attempt to halt the delivery before this time would almost inevitably result in a spillage of oil, resulting in customer dissatisfaction. Moreover, the oil would not be saved for the operator but would be wholly wasted. Therefore it appears that failure to deliver at a rapid rate will not result in short measure due to the impatience or dishonesty of the operator.

The important consideration from a weights and measures standpoint is that a full quantity be delivered to the consumer. Assuming the correctness of the container, the smaller the amount of oil retained in it the more nearly correct will be the delivery. To determine the necessity of a vent the curves on the graph representing those bottles not having vents (bottles Nos. 3, 4, 5, and 6) may be compared with those having vents (Nos. 1 and 2); if the former retain more oil than the latter then it may be indicated that the vent is a justifiable requirement; if the fact is otherwise it would appear that there should not be a mandatory requirement for a vent.

Referring to the graph, we find that at the end of a 10-second period one bottle without a vent retains the same amount as one of the vented bottles and less than the other vented bottle, while a second bottle without a vent contains less oil than one of the vented bottles. At the end of the 15-second period two bottles not vented are found to contain less oil than either of the vented bottles, while a third retains less oil than one of the vented bottles. At the end of 30 seconds only one of the bottles not vented retains more oil than the better of the two vented bottles; while at the end of the 45-second and the 60-second period all four of the nonvented bottles are found to retain less oil than either of the vented bottles. It appears that there is on the average no greater quantity of oil retained in the bottle in the case of the bottles examined in which vents are not present. During the longer periods the amounts of oil retained in the nonvented bottles are less than the amounts in vented bottles. Therefore, there appears to be no such weights and measures necessity for a vent as to justify its inclusion in the code of this conference.

The limitation on maximum height falls somewhat in the same category. The tallest glass bottles may drain more slowly than some of the other types. The curves seem to demonstrate, however, that the tall glass bottles do not retain more oil after the main flow has broken down to a trickle flow. To demonstrate the validity of this conclusion we may again turn to the graph. The tallest glass bottles are Nos. 5 and 6. Comparing the curves of these bottles with those of the other four bottles we find that at the end of the 20-second period one of them retains as little oil as any bottle, while the other retains less than one of the others and more than three of

Digitized by Google

them. At the end of the 45-second and 60-second periods these two bottles are average—both of them retain more oil than two of the shorter bottles and less than the remaining two. As a result it does not appear that from a weights and measures standpoint the height requirement can be justified. Consequently the deletion of this specification seems to be in order.

As suggested above, these data were made available to the committee on specifications and tolerances and doubtless assisted the members in formulating their conclusions, as will be indicated when that report is presented.

The data on the drainage of the various bottles were collected in the volumetric section of the division of weights and measures under the direction of E. L. Peffer.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON MODIFICATION OF SPECIFICATIONS AND TOLERANCES FOR LUBRICATING-OIL BOTTLES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN

Your committee on specifications and tolerances has to report that the present code for lubricating-oil bottles has been thoroughly reviewed in the light of performance data collected by the Bureau of Standards, and of suggestions received from other sources. As a result of this study your committee is recommending a number of modifications of the code, chief among which may be mentioned the deletion of the maximum height requirement and of the requirement for a vent.

One of the moot questions in relation to the use of oil bottles which are sealed at a central station and delivered in this form to the service station is whether they are to be considered as measures or as containers (packages). Of the oil companies which have addressed you this afternoon, one uses a measure type, one a package type. You have heard their arguments, have seen their bottles. Whether the package type should be allowed is one of the questions to be settled by you to-day.

The proponents of the package type say their bottle is not used as a measure—that it is filled by a machine which measures a predetermined quantity into the bottle, and it is sealed at a distributing plant—that it is to be regarded in the same way as lubricating oil in sealed cans, or as a package of any other liquid, as a beverage, for instance is regarded—and that it need not comply with specifications.

The proponents of the measure theory insist, on the contrary, that the lubricating-oil bottle differs from the ordinary package in at least one vital respect—that it is not delivered intact as a package to be carried away or otherwise disposed of as buyer sees fit, that it needs must be emptied at once into the crank case of the motor vehicle, that the purchaser never secures possession of the bottle nor has the opportunity of checking its contents, and that it serves exactly the same purpose as the older type of lubricating-oil bottles filled from bulk at the service station. They urge that some of the bottles are likely to be used regularly or in emergencies as measures by the service-station owner in delivering oil from bulk no matter how jealously the bottles are guarded and checked by the distributing company; that the purchaser is entitled to the satisfaction and the

Digitized by Google

safeguard of being able to check for himself the sufficiency of the filling; and that for these reasons a capacity mark is essential and should be included and all other specifications complied with.

It may be said at once that the code of specifications to be presented is similar to that which is now in effect, in this respect, that lubricating-oil bottles, whether sealed or unsealed, are regarded as measures. If the majority of weights and measures officials assembled here subscribe to the measure theory then the code will be satisfactory to them in that respect. If on the contrary the majority desire to allow the oil distributors to market their product in bottles as packages, then the code which will be presented will require amendments in this connection. As we understand it, the various jurisdictions which have given especial attention to this matter have been by no means unanimous in their conclusions. The specific recommendations of your committee are already in your hands in mimeographed form.

Respectfully submitted.

(Signed) F. S. Holbrook, *Chairman*,
I. L. Miller,
Joseph G. Rogers,
W. A. Payne,
Committee on Specifications and Tolerances.

DISCUSSION OF ABOVE REPORT

Mr. Holbrook. You now have in mind the evidence available to the committee and acted upon in the preparation of its recommendations.

The recommendations of the committee will now be presented. I think most of you have a copy of this; additional copies are available on the table for any who are not supplied.

The first recommendation is that a section be inserted to read as follows:

Definition.—Lubricating-oil bottles shall be construed to include all bottles used for the sale of lubricating oils for immediate delivery to the crank case of a motor vehicle, whether or not the bottle is used to determine the quantity of oil sold and whether or not it is sealed with a cap or some other device.

Obviously, that definition, in connection with the requirements occurring hereafter, will require that these bottles, regardless of whether they are sealed or unsealed, be regarded as measures. If that is not the consensus of the conference, the consensus should be developed and the code modified accordingly.

The chairman suggests that, if there is no comment, presentation of the recommendations continue in order.

It is recommended that present specification No. 1 be amended by striking out the words "Bottles used for the sale of lubricating oil" and inserting in lieu thereof the words "Lubricating-oil bottles," to make the specification read as follows:

Lubricating-oil bottles shall be made of clear, uncolored glass and only in sizes heretofore specified under the heading "Liquid capacity measures." They shall be made to contain their indicated capacities at a temperature of 20° C. (68° F.), and they shall not be subdivided.

The amendment in that specification is purely formal.

It is recommended that present specification No. 2, which fixes the maximum heights of bottles, and the note thereunder, be struck out

Digitized by Google

in their entirety. Attention has already been called to the fact that all height limitations were intended to be deleted from the code.

The next recommendation is that present specification No. 3 be struck out and that there be inserted in lieu thereof a specification to be numbered 2 and to read as follows:

2. A lubricating-oil bottle shall be marked on the side with its capacity and on the side or bottom with the name, initials, or trade-mark of the manufacturer.

The change in that specification is purely formal, no real change occurring in the meaning of the present specification.

It is recommended that present specification No. 4 be struck out. This reads:

4. Bottles shall be provided with a clearly defined graduation line blown or otherwise clearly and permanently marked in or on the bottle, and extending at least halfway around it, which indicates the correct capacity, and with the words "Fill to line" or a similar and suitable inscription clearly and permanently marked in or on the bottle and clearly referable to this graduation line. This line shall in no case be more than 0.10 inch in width and the bottom edge of the line shall define the top of the meniscus of the water which is used in the test of the bottle. This graduation line shall be placed so that it is at least one-fourth inch below the bottom of any metal top when this is screwed firmly into place or otherwise securely attached. The capacity of that portion of the bottle above the bottom of the graduation line shall be at least 3 cubic inches.

It is proposed that there be inserted in lieu of the above the following specifications to be numbered 3, 4, and 5.

3. A lubricating-oil bottle shall be provided with a clearly defined graduation line indicating its capacity, and with the words "Fill to line," "One quart to line," or a similar and suitable inscription, clearly referring to this capacity line. The capacity line shall occupy at least one-half of the circumference of the bottle, and shall not be more than 0.10 inch in width. This specification shall not be construed to prohibit the placing of an auxiliary line above the capacity line, to serve as a guide for filling with an excess measure of oil, but in case such auxiliary line is provided it shall be undesignated and shall be less prominent than the capacity line so that it will not be confused therewith.

4. A lubricating-oil bottle shall be so designed and constructed that the capacity of that portion of it above the capacity line is at least 3 cubic inches, and that there shall be at least one-fourth inch clear space between the capacity line and any metal or other opaque top or spout when such top or spout is screwed firmly into place or otherwise securely attached.

5. A lubricating-oil bottle shall be correct within the tolerance provided when filled so that the top of the meniscus of the water which is used in the test of the bottle coincides with the bottom of the capacity line.

The requirements of these specifications are similar to those contained in the specification already in effect.

It is recommended that present specification No. 5 be stricken out. This reads as follows:

5. When a bottle is equipped with a spout this shall be so constructed that free and unobstructed drainage is provided. This specification shall be construed to require that there be an effective air vent in the spout and no shoulder or other obstruction tending to result in a trapping of the liquid being delivered. The spout shall not be over 6 inches in length measured from the point of contact with the top of the bottle to the tip of the spout.

It is proposed that there be inserted in lieu thereof a specification to be numbered 6 and to read as follows:

6. A lubricating-oil bottle shall be so designed and constructed that free and unobstructed drainage is provided.

Digitized by Google

It is proposed to insert a specification to be numbered 7 and to read as follows:

7. All markings or graduations required by the provisions of these specifications shall be blown or otherwise permanently marked in or on the lubricating-oil bottle, and shall be clear and distinct.

It is proposed to amend the section headed "Tolerances" by striking out the words "all bottles used for the sale of lubricating oils" and inserting in lieu thereof the words "lubricating-oil bottles," to make this section read as follows:

TOLERANCES.—The tolerance to be allowed on lubricating-oil bottles shall be in excess only and shall be the values shown in the following table. There shall be no tolerance allowed in deficiency.

Capacity of bottle	Tolerance	
	Drams	Cubic inches
2 quarts	12	2.7
1 quart	8	1.8
1 pint	6	1.4

Mr. SWEENEY. Mr. Holbrook, how effective would this be if a concern decided to use a bottle not complying with your specifications as stated here and started to put that on the market to sell? What position could the sealers of weights and measures take in preventing its use?

Mr. HOLBROOK. That would depend upon the law in the particular State in question. Obviously this code has no force or effect until adopted in a jurisdiction. After the code had been adopted in a jurisdiction it would express the opinion of the weights and measures officials that all bottles used for the sale of lubricating oil were measures and must conform to measure specifications. If that opinion was not agreed with by an oil company the oil company would be entitled to go into court and bring injunction proceedings to prevent the condemnation of their bottles. The court would decide whether or not the lubricating-oil bottle was a measure and susceptible of regulation by weights and measures officials of the jurisdiction in question.

Mr. SWEENEY. Another question, Mr. Chairman. Would it be necessary for the sealer to seal those bottles?

Mr. HOLBROOK. That would depend upon the official in the jurisdiction. I take it that all officials would test a sufficient quantity of them to be able to determine whether in general they complied with specifications and were accurate within tolerances. The number of these will not approach the number of milk bottles in use and it is perfectly possible that in some jurisdiction the sealer might desire to seal them all, in which case he would do so.

Mr. SWEENEY. I might say, Mr. President, that in Massachusetts a law was passed by the last legislature that will allow the manufacturers to seal these bottles to be used for the purpose of selling lubricating oils. That would eliminate, so far as we are concerned, the actual sealing by the official.

Digitized by Google

Mr. HOLBROOK. Will that law apply to the bottles in use in filling stations, such as I have here [indicating bottle with metal spout]?

Mr. SWEENEY. That is handled by the director of standards, and I am not entirely familiar with the law, but I know action was taken on it. I presume in giving the right to the manufacturers, the director of standards in Massachusetts will carry out the specifications and tolerances laid down here.

Mr. HOLBROOK. I was just going to remark that this bottle which is filled at the filling station and delivered directly to the car is in the same category as any metal measure which might be used at the filling station. There is no distinction except in the shape and the material out of which it is made.

Mr. JOHNSON. Mr. Chairman, the State of Massachusetts has a new law of its own in reference to the marking that goes on that bottle and spout. In some details these requirements differ from the requirements in other States. Even the height and the width of letters that are to be used in the State of Massachusetts are fixed before a bottle can be sealed by a manufacturer. In other words, before we are given a serial number in the State of Massachusetts, the letters must be a certain size, and in a certain location, and even the seal has to be of a certain dimension, definitely specified by the State of Massachusetts. There will be a special requirement for oil bottles that have a spout. I have been informed by Major Meredith that the bottles will be subject to periodic inspection at a charge which I believe is made from time to time for such service. That is my understanding of what Major Meredith stated in his letter. I am not so sure about the charge, but I do know that that is what is required if the bottle is sealed by the manufacturer.

Mr. HOLBROOK. I have no doubt that Massachusetts will see to it that the bottles in use are accurate. Massachusetts has a reputation to that effect. I question, however, whether Massachusetts will require the periodic sealing of a glass bottle, because a glass bottle will not change no matter how long it remains in service. Once correct, it may be considered always correct.

Mr. SWEENEY. Mr. Chairman, I would like to say that where they are sealed by the manufacturer there would be no necessity of us resealing them. Of course, under the requirements of the Massachusetts law, in so far as the power is given to the director of standards, naturally the manufacturer who gets the right to seal these bottles will have to put on the designation number or letter which is required, together with the initial, name, or trade-mark of the corporation. I may say that the only interest the sealers will have subsequently thereto will be to make sure that the bottles are manufactured according to law and periodically the sealers of weights and measures will have the right to and will examine the bottles, but no charge will be made by them for that service.

Mr. SAYBOLT. Mr. Chairman, is there any provision under which a bottle may be considered a container and not a measure? Again, if a bottle receives its oil from a retail dispensing tank which tank is calibrated, would not that permit us to use the pump device on the tank which has been approved and sealed as delivering a quart

Digitized by Google

to fill the bottles, and then consider that a quart has been delivered into the bottle?

Mr. HOLBROOK. Under this code all lubricating-oil bottles used in the sale of lubricating oil for immediate delivery to the crank case of an automobile are considered as measures and must comply with the specifications. The proposed code has been so worded because the committee believes that the past actions of the conference constitute an instruction to the committee in that regard. Also, incidentally, the committee on its own account believes that is the proper viewpoint to be taken. If, as I have said, the consensus of the conference is that there are occasions under which these bottles are not to be considered as measures, then this code will necessarily have to be amended to meet the desires of the conference in that regard.

Mr. BAUCOM. Mr. Chairman, we have a law which requires that all containers of lubricating oil shall be labeled with the name of the oil, and so forth. That is one requirement that I think everybody manufacturing or selling ought to observe; they should specify what kind of oil it is and the net contents of the container. I do not know just how that will be done, but I think I may be able to work it out. Perhaps you might add to new specification No. 7 the words "in addition to such markings as may be required by the individual State law," or words to that effect, which will make the bottle comply with the State requirements.

Mr. HOLBROOK. Specification No. 7 is to the effect that the markings required by these specifications shall be marked in or on the bottle in a certain way. That would not apply to additional markings required by the State unless such markings were to be included in this code, in which case those markings would also have to be put upon the bottle in the manner prescribed in the specification. In framing that specification the committee had in mind the particular markings required by the code itself. If additional markings are to be required, then consideration should be given as to whether they should be blown in the bottle or whether they might not be indicated in some other manner.

Mr. HUBELE. We charge 10 cents for sealing a measure in St. Louis. Isn't it a fact that they are trying to get into use measures which need not be sealed annually? One company refused to pay fees on 100 bottles and I had to turn it over to the law department. The case involves the same kind of bottles we are discussing here, and if we lose that case we lose $3,500 to $4,000 in revenue.

Mr. HOLBROOK. I might say that I have so little sympathy with the fee system that that loss does not cause me much concern.

Mr. A. B. SMITH. Mr. Chairman, I would like to call Mr. Holbrook's attention to the substitute specification numbered 2. Suppose a company were to contract for a quantity of these bottles and should require that the manufacturer should blow in that bottle only the name of the oil company. Would that bottle without the trade-mark of the factory people come within that specification?

Mr. HOLBROOK. It would not comply with this code. It has been the policy of the conference in the case of milk bottles to require the name, initials, or trade-mark of the manufacturer of the bottles. Obviously in those States which have a law requiring manufacturers to furnish bond, such a provision is essential in order that the proper

Digitized by Google

manufacturer may be proceeded against under his bond in case the bottles which he puts upon the market are not correct. Perhaps some States would not be particular that the name, initials, or trade-mark of the manufacturer appear upon the bottles. However, I think it will be found that in almost every case the manufacturer puts his name or initials or trade-mark upon every bottle of such a type as this that he turns out. The requirement is important in that it allows the weights and measures official to put the responsibility of inaccurate bottles where it belongs, namely, upon the manufacturer. I would hold that if the name, initials, or trade-mark of the manufacturer does not appear upon the bottle the code is violated.

Mr. A. B. SMITH. That is the point in which we are interested.

Mr. SWEENEY. Do I understand that you would delete the height requirement? If you do, you are going to open up an avenue where bottles of any height can be put into use.

Mr. HOLBROOK. We have not found a bottle which is objectionable from the standpoint of its height. A year or two ago we considered this tall bottle [indicating] to be objectionable. Our investigations show that it is not objectionable. The committee considered whether a new height requirement should be prepared and decided to let the matter take care of itself. The height of a bottle will be, to a certain extent, regulated by the breakage. The greater the height of the bottle and the smaller the base, the more likely the bottle is to be broken. Whether this bottle is the maximum height which would be nonobjectionable from the standpoint of retaining oil, frankly, the committee does not know, because they have not had any taller bottles to investigate. We decided to eliminate the height requirement completely rather than write a new height limitation which might be shown to be faulty in a year or two.

Mr. WARNER. Mr. Chairman, I wonder if the committee has considered a bottle which might be wide at the base and narrow in the neck. How about that type of bottle?

Mr. HOLBROOK. The committee does not desire to regulate unnecessarily. We do not know that a shorter bottle than any of those we have here would necessarily be unsatisfactory. Therefore, we have not specified either a maximum or a minimum height, since we consider the bottles at present in use to be unobjectionable from a height standpoint.

Mr. SAYBOLT. Are there specifications and tolerances which govern metal retail-dispensing units which might be used in lieu of bottles?

Mr. HOLBROOK. Yes; they come under the provisions of the liquid-measure code.

Mr. SAYBOLT. Then it would be required, as a matter of protection, that any medium used to transfer oil from a retail storage tank, the pump on which was sealed and approved as delivering the quart, to a car would have to be of an approved measure and within the tolerances? You could not use a tomato can; you could not use a mayonnaise jar or a water pitcher.

Mr. HOLBROOK. Yes; I think you could use any container to take the oil from a sealed pump to a car excepting a container which looks like a measure and which might be used as a measure in a station. If a water pitcher did not retain an excessive amount of lubricating oil there is nothing in the specifications which would prevent it from

Digitized by Google

being so used, for a water pitcher does not simulate a measure. A metal container or a glass bottle, that looks like a measure would be required to be an accurate measure on account of the danger of its being used as a measure at a filling station.

Mr. SAYBOLT. In my next question please understand that I have no desire to beg a logical issue which is perhaps for the protection of the consumer, nor to be in any way facetious, but I am trying to clarify one remaining point: Suppose a bottle were blown that was most irregular in shape, which had no regularity to its dimensions at all, and thus could never be assumed to be a measure; that would probably then pass without the necessity for coming up to the specifications and tolerances just suggested?

Mr. HOLBROOK. If it were a bottle used for the sale of lubricating oil, even to transfer a measured quantity from a pump to a crank case, under these specifications I am inclined to think that it would have to be a measure. The idea, of course, is to prevent the service station from having a number of irregularly sized containers about the station which might readily be used as measures, but in respect to which representations might be made that they were not used as measures but merely as containers to remove oil from a storage tank to the car. The amount of regulation necessary for the weights and measures official to see to it that they were not improperly used, would be tremendous. If there were to be allowed around the station containers which were not measures and not of the accuracy of measures, but which looked like measures, then there would be danger of their improper use in all cases.

Mr. SAYBOLT. I made that point, Mr. Holbrook, because I would like to say that there are two reasons why the industry has used glass bottles. The sealed bottle is the type which protects the consumer's interest and the oil company's reputation in the case either of a premium oil or a branded oil. The unsealed-bottle type is intended to speed up service, since the service-station operator is enabled to fill those containers during slack periods and have them ready for service immediately upon the approach of a car with a request for oil. We are simply desirous of all the clarification we can get, since we realize that the best minds in the various States, or counties, or municipalities, may make regulations which are not entirely uniform, and it might easily happen, of course, that such regulations would create hardships not only upon the manufacturers of the containers but also upon the vendors. If we seem to ask a lot of questions, it is just to approach the desired situation without unreasonable expense.

Mr. MARONEY. May I ask why the specification calls for glass? We know that most of them are of glass, but they might be molded of any type of material. It might be well to change it so that it would read "glass or other transparent substance."

Mr. SAYBOLT. I might supplement it by saying that a type proposed and suggested for the market is somewhat like the cardboard milk container which you buy in some of the stores.

Mr. HOLBROOK. If the container were not transparent, obviously it should not have a filling line such as is proposed here, because you could not fill to it.

Digitized by Google

Mr. SWEENEY. Mr. Chairman, I believe that in view of the fact that time has proven that there are a great many bottles of different sizes put upon the market, it might be well for weights and measures officials to consider all bottles to be measures. You should not lose sight of the fact that the main purpose of weights and measures officials is the protection of the public as well as the protection of the manufacturer. The time has come, or is pretty close at hand, when we must take a stand, and I think that the simplest way out of it would be the establishment of these bottles along the lines of definite measure. Then it will be an easy matter of inspection to determine from a test of a bottle whether or not it conforms with the law.

Mr. BAUCOM. It might be desirable to add in there a time element—that all bottles used for lubricating oils shall be designed to deliver in 30 seconds, for instance. I offer that for your consideration.

Mr. RICHARDS. After listening I am inclined to believe that there is some lack of confidence. You spoke about the height of those bottles. We find a bottle measuring 18 inches. I think that the glass manufacturers will bear me out when I say that we know of no machine that will produce a bottle longer than that. We have no reason to believe that a bottle will be made shorter than those you have there [indicating]. Such a bottle would be too large in diameter and would have a shoulder on it; you would have a container which would not be suitable for the purpose intended. The problem is confronting us which is confronting you, standardization and simplification. The machines and molds to make these bottles are very expensive. We have not shirked for one minute to meet the needs of the various States, but if it will be necessary to seal these bottles for various States that means that you will pile upon the industry a heavy expense, and you will get away from standardization. If we could have one mark on them that was interchangeable among all the States, you would simplify the whole thing.

Mr. FRENCH. Old paragraph 4 required the capacity graduation to be indicated by the words "Fill to line," or a similar and suitable inscription. In new paragraph 3 the words "Fill to line," "One quart to line," or a similar and suitable inscription is provided for. Could not something be done to at least suggest to the various States that certain inscriptions on that bottle would be interchangeable? If one State requires the inscription, "Fill to line," and another State requires something else, then the bottle will look like a Chinese puzzle.

Mr. HOLBROOK. The present recommendation is to strike out old specification No. 4 and in lieu thereof to insert in the code new specifications to be numbered "3," "4," and "5." In specification 3 it is provided that the words inscribed may be "Fill to line," "One quart to line," or any other words having the same meaning. Either of the quoted inscriptions would be satisfactory to all States adopting this code. It is pointed out that you do not have to use any definite wording provided you have a wording which properly expresses the idea.

Mr. FRENCH. A bottle will not be acceptable in a State where the blown-in readings do not meet its specifications.

Digitized by Google

Mr. HOLBROOK. Any State adopting these specifications would accept the words "Fill to line" or the words "One quart to line," or any other similar and suitable inscription, under the terms of its own specifications. These specifications are proposed to the States to be adopted in their entirety. If one firm wants to use the words "Fill to line" and another firm wants to use "One quart to line" either would be accepted in all States which adopted this specification the way it stands now.

Mr. SWEENEY. In other words, Mr. Holbrook, if these specifications are adopted in a State the sealers of weights and measures will proceed to seal a bottle if it complies with the tolerances and specifications. In a State which permits the manufacturer to seal bottles, when they bear a designating mark, it will only be necessary for the sealers to see that the designating mark is upon them before they are distributed throughout the State.

Mr. HOLBROOK. The designating mark is required under the State law and not under this code.

Mr. FRENCH. I am trying to simplify this by a suggestion that bottles be made interchangeable in the various States, and thus reduce the cost of them.

Mr. RICHARDS. Mr. Holbrook, I believe the Massachusetts requirement is that there be two arrows, one on each side, pointing to the line.

Mr. CAREW. Mr. Chairman, I think the gentleman is mistaken in that last statement. The law in Massachusetts only requires one arrow. I might add that in my home town of Medford, where I am the sealer, it is not necessary to seal the oil bottles in a station where the pumps have been sealed—the bottles are only used as containers. That same law holds throughout the entire State.

Mr. BURKE. Mr. Chairman, would not specification No. 3 be simplified by using either one or the other of the two wordings "Fill to line," "One quart to line"?

Mr. HOLBROOK. The committee did not feel that any hard and fast wording should be required. Sometimes one and sometimes the other may be preferred. For instance, this bottle here [indicating] is supposed to hold 1 quart to this line [indicating the capacity line on the bottle], but they intend to fill to this fine line [indicating a lighter graduation line above the capacity line] because it is intended to put 3 per cent excess in the bottle. In the case of this bottle the capacity line—the lower of the two—would be more appropriately marked "One quart to line" than "Fill to line." The wording is simply alternative. Any manufacturer who desires to use "One quart to line" can use that language; likewise any manufacturer can use the words "Fill to line." If this specification is adopted in any State either phrase will be satisfactory and the manufacturer can select either one, or any other suitable wording that he likes.

Mr. BURKE. How will the sealer recognize it?

Mr. HOLBROOK. The upper line is put on to indicate to the employees of the oil company the point to which it is desired to fill, but they tell the public that the bottle holds a quart when filled to that lower line, which is perfectly correct. This difference repre-

Digitized by Google

sents an excess measure which the company desires to put in the bottle.

Mr. W. L. DAVIS. Mr. Chairman, suppose bottles are made of tin and are of the same dimensions, have the same capacity and are sealed in the same way as these glass bottles. They are used to distribute oil. Would it be considered a measure, or what would it be?

Mr. HOLBROOK. If this container were tin and sealed and delivered to the purchaser who desired to carry it away, it would doubtless be a package just the same as the rectangular oil can which is delivered under similar circumstances is a package.

Mr. W. L. DAVIS. Suppose the contents were poured into the car in the same way as from those glass containers?

Mr. HOLBROOK. Certainly a thing like that, constructed out of tin, which is supposed to hold its capacity to some point down inside, could not be used the same way, since the height of the contents in reference to a capacity line could not be checked.

Mr. W. L. DAVIS. But the filling machine from which it is filled would be the measure?

Mr. HOLBROOK. The manufacturer would be allowed to determine the quantity by any reasonable means, but he would be held accountable for full measure.

Mr. W. L. DAVIS. Would it not be the same for any other package, as well as a tin package?

Mr HOLBROOK. If all these specifications are adopted glass bottles will fall into the category of measures.

Mr. FRENCH. Mr. Chairman, how will these specifications affect the old glass bottles which we are using now?

Mr. HOLBROOK. Bottles will continue in use if complying with this specification as set up here.

Mr. FRENCH. Some of the bottles that we are using now will not meet those specifications, will they?

Mr. HOLBROOK. In what respect?

Mr. FRENCH. The wording as blown in the bottle—and the line and the arrow on the bottle?

Mr. HOLBROOK. The requirements you mention have been in force and effect since 1929. This bottle [indicating] has blown in it the proper wording, and the line and arrow, yet it was picked up some two or three years ago. If a bottle is used as a measure and does not have a capacity line on it, it ought to be condemned.

Mr. FRENCH. I mean the wording "one quart"?

Mr. HOLBROOK. Every liquid measure has been required to be marked with its capacity since 1913.

Mr. FRENCH. Suppose we adopt "One quart to line" instead of "Fill to line."

Mr. HOLBROOK. The inscriptions are simply alternative. Either one or the other, or an equivalent wording, will be satisfactory. "Fill to line" was suggested formerly and this is still satisfactory. There is no change in the specification in that regard, except that it is broadened; a new example is given, but the old wording has not been repealed.

Mr. I. L. MILLER. Mr. Chairman, may I suggest that manufacturers were never limited to the phrase, "Fill to line." A similar

Digitized by Google

and suitable inscription has always been allowed. Certainly "One quart to line" would have been acceptable under the old specification.

Mr. RICHARDS. Mr. Chairman, we had some discussion in regard to wording. In regard to the developing of bottles I might say that recently we developed a bottle. After the bottle was completed the law in Massachusetts was amended. The name of the manufacturer is now required to be put on the face of the bottle. No other State has that requirement; other States are satisfied with initials. It was found that the wording "Liquid contents one quart" was not acceptable to the State of Massachusetts—Massachusetts requires the words "One liquid quart." On account of those requirements our bottle would not be accepted. Two arrows are now required on the bottle when used as a sealed container. We have only one arrow. Another point that was brought up was that the inscription was placed vertically along the arrow. Under the new law of Massachusetts it must be horizontal below the line. Those are points that are being discussed.

Speaking from our own marketing point of view, it is almost impossible for us to segregate our bottles and have one set of bottles for one State and one set for another. If it is generally accepted that there must be a State seal on the bottle, we feel that each State should accept a bottle bearing the seal of any State—the State seals should be interchangeable. It would be impossible to make different markings for the various States.

Mr. JOHNSON. It is not very often that we have an opportunity to have with us so many people who are so influential in weights and measures work. I would like to say that our bottles with the mark of the State of Minnesota have been passed in every State where we have had any experience, except in Massachusetts. Under the new law in Massachusetts our markings are no longer acceptable. We appreciate what has been done, since we could not smear a bottle up with a number of seals; it would make the bottle look bad. To make different bottles is expensive; it takes 10 large and expensive molds for a bottle. However, we all appreciate the fine cooperation we have received in the various States.

Mr. RICHARDS. Mr. Chairman, I think you can have the assurance that the glass-container manufacturers will make their bottles of the specified size; they, on their part, would like to be assured that when they are of the proper capacity and properly marked, they will not be condemned.

Mr. ROGERS. While on this subject, I would suggest to the representatives of the glass industry that before they proceed with any large program in filling orders, they submit initial samples to us. We had a serious condition which might have reacted very unfavorably. An oil company submitted a wooden pattern of a proposed bottle, but we had not been able to approve the capacity without a test. Four carloads of a 16-carload order were then shipped. A representative of the company suddenly had the thought that he had better come down with some of the bottles to see if they were all right. These samples of the bottles were found 1 fluid ounce short. The four carloads were rejected, shipped back to the factory, and, I suppose, remelted. I think it would be a good idea for the manu-

Digitized by Google

facturers to ship samples out to the various States that have these requirements. I personally would like to see that done for New Jersey, and I think some other States also would be glad to see it done.

Mr. McFADDEN. Mr. Holbrook, when you find that tall bottle which has no filling line upon it, used as a measure, what would you do with it?

Mr. HOLBROOK. How can it be used as a measure when it has no filling line?

Mr. McFADDEN. I find it is being used as a measure in my county.

Mr. HOLBROOK. When is a measure not a measure? When it has no capacity point.

Mr. McFADDEN. When bottles of oil are allowed to remain in the sun, some of them will be filled up to the cap, while in others the oil level may be 2 to 2½ inches below the cap. Often people who want to buy the oil will say, "Give me that bottle there," indicating the bottle that appears to have the most oil in it.

Mr. WARNER. Mr. Chairman, I have not heard of any particular reason why there is objection to putting the capacity mark on that tall bottle.

Mr. BAKER. Mr. Chairman, certain objections have been cited that have not been commented upon. There were points brought out by the oil companies which I think quite important. For instance, there is the difference between the marking required in Massachusetts and in other States.

Mr. SAYBOLT. I think that is one objection; bottles are nonacceptable in Massachusetts when they have been accepted by the other States.

Mr. HOLBROOK. Of course the main reason for the existence of this conference is to provide that a policy that is satisfactory in one State is satisfactory everywhere. This conference is endeavoring to work toward that ideal.

Mr. BEATON. Mr. Chairman, in specification No. 1, I note that a temperature of 20° C., or 68° F., is specified as the temperature at which bottles shall be made to contain their indicated capacities, whereas gasoline and kerosene oil are sold on a basis of 60° F., which is recognized by the Bureau of Standards. I wonder what the thought was in changing that specification. It will make some difference.

Mr. HOLBROOK. In the first place, I think a difference of 8° F. would affect the capacity of the bottle so slightly that it would be difficult to detect the difference in any ordinary test. Moreover glassware has always been standardized on a basis of 20° C. and that same temperature has been carried in many other specifications, I think there can be no difficulty on this score.

Mr. BEATON. What I had in mind was this: If this is adopted by the members as a part of the code, what effect would this have on the industry as a whole? All weights per gallon are based on 60° F., and if this change is made it will be reflected all down the line.

Mr. HOLBROOK. I would not suppose that a specification of this sort would influence the custom of the trade, because all the code requires is that these bottles shall be similar to all other graduated glassware and be made to be correct at 68° F. The practice of selling petroleum

Digitized by Google

products at wholesale need not be affected in the slightest degree thereby. We will merely be following firmly established practice in each case.

Mr. BAUCOM. Mr. Chairman, I think the Supreme Court will not uphold your decision in providing that there shall be no tolerance in deficiency and I believe you are trying to pass something which is impossible for manufacturers to live up to.

Mr. HOLBROOK. The tolerances allowed on these bottles are very large. The United States Supreme Court in the case of a bread law has already declared that it is constitutional to allow no tolerance in deficiency.

The ACTING CHAIRMAN. The question is upon the adoption of the code.

(It was moved and seconded that the report of the committee be adopted as recommended, the question was taken, and the motion was agreed to.)

(At this point, at 5.15 o'clock p. m., the conference adjourned to meet at 10 o'clock a. m., Wednesday, June 3, 1931.)

Digitized by Google

THIRD SESSION (MORNING OF WEDNESDAY, JUNE 3, 1931)

The conference reassembled at 10.06 o'clock a. m., at the Bureau of Standards, Dr. George K. Burgess, president, in the chair.

The CHAIRMAN. Gentlemen, the conference will please be in order.

It may be of interest to you to note that there has been issued a list of the persons attending the conference, that can be obtained at the desk. I think it is particularly gratifying that there are here representatives of 25 States and also the District of Columbia, which, the chairman thinks, is a very good record, especially for this year.

The first paper on the program for this morning was written by Charles M. Fuller, city and county sealer of weights and measures, of Los Angeles, Calif. Mr. Fuller expected to be present, but at the last moment found that he would be unable to attend.

EQUIPMENT FOR TESTING LARGE-CAPACITY METERS FOR PETROLEUM PRODUCTS[1]

By CHARLES M. FULLER, *City and County Sealer of Weights and Measures, Los Angeles, Calif.*

Probably no line of industry has progressed more rapidly, both in volume and in the development of new devices and types of equipment for handling its product, than the business of producing and selling gasoline and petroleum products. Keeping up with this progress and with the increasing demands made upon our department has been a constant problem.

Only a comparatively few years ago one man was able to work along "Automobile Row" on foot, carrying all the testing equipment in his hands that was necessary for the primitive 1-gallon pumps and measures, which constituted the sole means of selling to the public. Compare this with the present time, when in one year we made 16,644 inspections of gasoline measuring pumps or devices and 4,225 inspections of grease "guns"; gaged 653 large vehicle tanks and trailers, many of them having a capacity of over 3,000 gallons; and inspected 269 large-capacity meters of the wholesale type.

From previous papers which have been presented here, you are familiar with the equipment which we have designed and built for most of this work. Last year we found ourselves confronted with the problem of an adequate method for testing large-capacity meters whose rate of flow was from 150 to 300 gallons per minute. It was obvious that our 50-gallon outfit was entirely too small to be of value.

[1] In the absence of Mr. Fuller this paper was read to the conference by F. S. Holbrook, secretary of the conference. A lantern slide illustrating the equipment was exhibited and explained. In this connection Mr. Holbrook suggested to the conference that there was a need for a code of specifications and tolerances covering liquid-measuring devices intended for wholesale deliveries of liquids.

Digitized by Google

Of course it was possible to carefully gage a vehicle tank and use this for a test run, but this method was slow and inefficient.

In the meantime these large meters were being installed on loading racks, at wholesale yards, and on the docks, and the demands made upon this department that they be tested and sealed were increasing. An appropriation was obtained and an outfit designed and built. It has now been in use for a number of months and has proved its value and efficiency.

It consists of two test measures or tanks, each having a capacity of 300 gallons, with graduated gage glasses, mounted on a truck. The gages are placed on both sides of the dome, so that if the truck is not on level ground an average or mean reading can be taken. The graduations are 3/8 inch apart for each quart, and give us a capacity of 4 gallons above and the same amount below the zero indication.

A pump operated by a power take-off from the engine enables us to empty the test tank in four minutes. A connection is provided so that we can use this same power pump to drain our 50-gallon outfit. A manifold also enables us to drain the tank by gravity if desired.

The capacity of each tank is exclusive of the pipe lines and the valves are placed close to the tank outlet so as to prevent formation of any air pockets. Air vents are also provided on top of the tanks.

A cupboard or locker on the back of the truck provides space for test measures, tools, and other equipment.

If any of the delegates should be planning to build such an outfit, we will be very glad to furnish them with the details of its construction.

STATE REQUIREMENTS FOR NET-CONTENT MARKING OF PACKAGES OTHER THAN FOOD PACKAGES

By Howard S. Jarrett, *Commissioner of Weights and Measures, State of West Virginia*

The subject which has been assigned me, State Requirements for Net-Content Marking of Packages Other than Food Packages, I will deal with according to the laws of my own State and the experiences in connection therewith. In doing so I believe that similar circumstances surround the work in 14 other States that have practically the same statutes or regulations.

Section 24, chapter 47, of the Code of West Virginia, pertaining to weights and measures, provides:

> It shall be unlawful to keep for the purpose of sale, offer or expose for sale, or sell any commodity in package form unless the net quantity of the contents be plainly and conspicuously marked on the outside of the packages, in terms of weights, measures, or numerical count: *Provided, however,* That reasonable variations or tolerances and also exemptions as to small packages shall be established by rules and regulations made by the commissioner of weights and measures: *And provided further,* That this section shall not be construed to apply to medicinal articles and to those commodities in packages the manner of sale of which is specifically regulated by the provisions of other sections of this act.
>
> The word "package" as used in this section shall be construed to include the package, carton, case, basket, can, box, barrel, half-barrel, hamper, keg, drum, jug, jar, crock, bag, pail, wrapping, parcel, package, bottle, phial, or other receptacle put up by the manufacturer; or, when put up prior to the order of the commodity, by the vendor; which may be labeled, branded, or stenciled or

Digitized by Google

otherwise marked, or which may be suitable for labeling, branding, or stenciling, or marking otherwise, making one complete package of the commodity. The word "package" shall be construed to include both the wholesale and the retail package: *Provided*, That a box or carton used for shipping purposes containing a number of similar packages which are individually marked, as hereinbefore provided, will not be required to bear the weight or measure of contents.

You will note the word "package" is defined in such a manner there is no escape from its meaning or little margin for a controversy as to the requirements of the law.

In these days and times we must visit the hardware stores, the 5-and-10-cent stores, the department stores, and many other merchandising concerns to find whether the statute is being observed. While grocery stores are confined mostly to the sale of foodstuffs, we do find there also commodities other than foods requiring certain content markings. There are also many of these packages in drug stores, although drugs seem to be a secondary consideration in many of our pharmacies to-day. * * *

It is quite difficult to keep away from the question of net-content marking of foods and drugs in preparing a paper, as these commodities constitute 90 per cent of the reweighings or examinations.

Only 15 States have specific laws on package-content markings for commodities other than foods and drugs. If every State would have an identical statute or regulation, and these rules were strictly enforced, little difficulty would be encountered. Each State would thus not only see that its own laws were observed but its vigilance would greatly assist the officials in other States. I find, however, that commodities of national distribution are almost always properly marked.

Packages containing 2 ounces avoirdupois or less are usually termed "small" and are exempt from marking in terms of weight, as are packages of 2 fluid ounces or less exempt from markings in terms of measure. Packages containing less than 6 units of a commodity are usually termed "small" and not required to be marked in terms of numerical count. My experience has been that when violations occur it is usually because packages are without any markings whatever, rather than incorrect markings.

While we have no definite program of inspection, the inspectors in visiting a merchant for the inspection and testing of scales extend their work to reweighing of packages and examination of all goods sold by weight, measure, or numerical count. The manufacturers of package goods cooperate satisfactorily with the department and have been found willing to correct any errors that might be found.

I would venture the assertion there are not more than three out of five people who purchase commodities that pay the attention they should to the content markings. Then the weights and measures official is rendering a degree of protection to every purchaser of which the buyer has no knowledge. Or else the purchaser has placed confidence in the weights and measures official to the extent that he feels he is receiving his money's worth because of the alertness of the sealer. We do not want that confidence placed in us to wane—then we must constantly be on the job to keep faith with others.

The officials of each State have their own problems and correct them to their own satisfaction. They render efficient service to their own people and in so far as their own particular rules and regulations

Digitized by Google

are concerned, but there should be a spirit of cooperation manifested on this question as between States.

* * * * * * *

The CHAIRMAN. The Chair has just been informed that the Secretary of Commerce has been obliged to go to New York on unexpected urgent business. I can assure the conference that he had a paper ready to present, and as late as 9.30 o'clock this morning his secretary told me that he would be out here. He sends his regrets to the conference that he can not be present.

PROPOSED CONSOLIDATION AND AMENDMENT OF FEDERAL STANDARD-CONTAINER LEGISLATION

By H. A. SPILMAN, *Senior Marketing Specialist, Bureau of Agricultural Economics, United States Department of Agriculture*

Gentlemen of the conference, before proceeding with the discussion of this proposed consolidation of container legislation I would like to call your attention briefly to the exhibit of containers that we have on the other side of the room. These exhibits cover the containers and baskets standardized under both the acts of 1916 and 1928. There is a greater degree of standardization of those baskets than seems to be indicated by the number of samples that we have there.

The standard container act of 1928 requires submission for approval of dimension specifications. Specifications are approved, providing containers made in accordance therewith are of proper cubical capacity and provided they are not deceptive in appearance. Under this dual requirement the results of our efforts to hold the number of different shapes to a minimum have been very gratifying. In other words, there has been developed a large degree of uniformity in the dimensions and shapes of the several sizes of the various types. But while considerable has been accomplished there still remain some more or less minor differences to be eliminated in certain types, particularly splint baskets. In these we started with less data and information than were available for the hampers and round stave baskets, and we have found considerably more local prejudice to be overcome in these baskets than was perhaps true in any of the others. However, even in splint baskets, which are after all more or less a local proposition, the specifications for any given community or territory have been brought to common standards. For instance, we have in the 8-quart diamond-weave overhandle basket an Ohio type, a Pittsburgh type, and a New York type. There is a New York type of 12-quart diamond-weave overhandle which is somewhat different from the 12-quart made in all other sections. However, the commonest size of diamond-weave overhandle splint basket, the 16-quart, is practically identical the country over.

Let me briefly review some of the factors involved in the simplification of containers for fruits and vegetables. We have mentioned local prejudice. Then there are differences in the species of woods used; differences in manufacturing methods; the human equation and the eternal quest of human nature for change. These several factors effectively preclude the probability of effecting standard-container specifications by the mere standardization of the forms. The

Digitized by Google

program must reach back through the sales room and assembly room to the lathe and clipper of each individual manufacturer.

An important and sometimes distressing factor in the simplification of container specifications is differences in types of construction. For instance, in hampers we have those with flush top and bottom; hampers with the inside top hoop set down to accommodate the cover; hampers with raised bottoms; and hampers made like barrels. In straight-side baskets there are bent bottoms, removable bottoms, fixed fabricated bottoms, solid-board bottoms, baskets with two center hoops, and hamper-type baskets. Besides these there are baskets with covers setting down inside like hampers and baskets with both top and bottom removable. Some of these are not yet of commercial importance. When it comes to splint baskets there are, first, the diamond-weave overhandle, drop-handle, and no-handle types; some made with eight splints and others with nine splints. In the square-braid splints there are mostly the over-handle types with a few no handles, and, I believe, an occasional drop handle. But here we have the corners either scored and square at top and bottom, scored at bottom and round at top, or round at both top and bottom. And finally the slab baskets, which are close kin to the square-braid type.

While the containers displayed here do not include all of the various types of construction, they do show the range of sizes and the degree of differentiation between them according to the specifications which we recommend and strive to have accepted in all cases. It is a striking contrast to the conditions existing with regard to the berry boxes and till baskets for which, under the act of 1916, no provision is made for regulating dimensions.

This exhibit will give you an opportunity to observe how many different kinds of shapes and sets of measurements are used in the manufacture of splint baskets and will serve as an object lesson of the further need of simplification of these containers.

Standard containers—standard container act of 1928

Established standards	Number of shapes or specifications	Variants and types
Hampers:		
⅛-bushel	One	1. Regular flush top. 2. Raised bottom. 3. High hat. Same as above plus 4. Cross-brace stave. 5. Square hamper.
¼-bushel	do	1. Regular flush top. 2. Raised bottom. 3. Cross-brace staves. (8 and 8½ inch bottoms).
⅝-bushel	do	1. Regular. 2. Cross-brace staves.
¾-bushel	Two	1. Based on old ⅞ bushel. 2. Based on old 1 bushel.
1-bushel	Four	1. Regular—set-down hoop. 2. Flush top. 3. 10-inch bottom—storage. 4. Lobart export—13-inch bottom. 5. Oval.
1¼-bushel	One	
1½-bushel	Two	1. 9-inch bottom regular and flush top. 2. 10-inch bottom.
Round stave baskets:		
⅛, ¼, ½, ¾, and 1-bushel	One each	

Digitized by Google

Standard containers—standard container act of 1928—Continued

Established standards	Number of shapes or specifications	Variants and types
Straight-side baskets:		
⅛ and ¼-bushel	One each	
½-bushel	Two	1. Bent bottom. 2. Same with 2 middle hoops. 3. Flat (planters).
¾-bushel	One	
1-bushel	Practically one (Slight variations in depth and bottom diameters.)	1. Bent bottom. 2. Same with 2 middle hoops. 3. EZ Pak. 4. Fixed fabricated bottom. 5. Hamper type. 6. Top and bottom both removable. (Heacock.)
Splint baskets:		
Diamond-weave overhandle—		
4-quart	One	
8-quart	Three	1. Ohio type. 2. Pittsburgh type. 3. New York type (9-splint).
12-quart	Two	1. Regular (8-splint). 2. New York (9-splint).
16-quart	One	
24-quart	do	
Diamond-weave drop-handle—		
4, 8, and 12-quart	One each	
16-quart	Two	1. 8-splint. 2. 9-splint.
Square-braid and slab baskets: 4, 8, 12, 16, 24, and 32 quarts.	One each	1. Round top. 2. Square top. 3. Round corners (very few).

Handle or no handle baskets conform to same specifications.

Now we may return to the consideration of the proposed consolidation and amendment of the Federal standard container acts. I take it that you have all been supplied with a copy of the text of this proposed consolidation, and I want to discuss as rapidly as I can the factors that caused us to suggest such a consolidation, and then run briefly over the proposed draft itself.

Let me remind you first that we have on the Federal statute books four laws relating to the standardization of containers for fruits and vegetables. The two earliest of these are the law establishing the standard apple barrel, which was approved on August 3, 1912, and the law establishing the standard barrel for fruits and vegetables and the standard barrel for cranberries, which was approved on March 4, 1915. The third act is what is commonly known as the standard container act of 1916, which was approved on August 31 of that year, and the fourth is the standard container act of 1928, which was approved on May 21 of that year.

These laws have been in effect for a sufficient length of time to bring out certain deficiencies which exist therein. Most of these deficiencies tend to make the acts harder to enforce. Some of them represent mere inconsistencies and others extend the scope of the act beyond any intention of those who framed the legislation. All of us who have had anything to do with laws relating to containers have known all these deficiencies for some time and have realized the desirability of initiating action looking toward the correction of conditions. Some of the interpretations placed upon the standard container act of 1928 have extended the scope of that act further than any of us desired and have served to focus attention on the need of change in all of these container acts.

When I talked to you last year I told you that we realized that the wording of and the interpretations placed upon the act of 1928

Digitized by Google

seemed to endanger much that had been accomplished by weights and measures officials throughout the United States looking toward the retail sale by weight and numerical count. I assured you at that time that the Department of Agriculture had no desire to render ineffective the good work already done along such lines and that we had already consulted with representatives of the Bureau of Standards regarding possible changes in the act of 1928 and expected to continue those discussions.

In the meantime various onslaughts have been made on the old standard container act of 1916. This is the law which establishes three standard sizes for Climax baskets, establishes the half pint, pint, and quart as the standard sizes for berry boxes, and provides in effect that till baskets shall be made in the multiples of the dry quart. This act as passed was a combination of a bill introduced for the standardizing of Climax baskets and three bills introduced for the standardizing of berry boxes. The combination was made rather hurriedly and no great attempt seemed to have been made to make the language of the law consistent throughout. This has resulted in some loopholes, and during the past year various parties have made successful attempts to take advantage of these loopholes. This circumstance brought to the fore the question of revising the 1916 act, and it was suggested that both of the laws be combined in one act to cover the whole field of baskets for fruits and vegetables.

This suggestion recalled one made some two or three years ago by one of the largest manufacturers of baskets in the country, a company which also manufactures many barrels. This particular firm had some competition from manufacturers making barrels which were believed to be nonstandard and had also had some difficulty with small plants under contract to make barrels for them. They found these small plants very careless, so they claimed, with regard to making barrels according to the standards set up by law. A representative of this firm approached the Department of Agriculture and asked if it would be possible for us to undertake the enforcement of the standard barrel law. We replied that it would not be because we felt that such authority was vested in the Bureau of Standards. He then asked whether we would be willing to have the enforcement of barrel legislation added to our duties, and was told that we felt that the question of any such change should be taken up first with the Bureau of Standards rather than with the Department of Agriculture. This suggestion was followed, and, as a result, certain correspondence ensued in which the Bureau of Standards indicated their entire willingness to accede to the enforcement of the barrel laws by the Department of Agriculture. The matter rested there.

These discussions were recalled and the suggestion made that if new legislation were to be considered it might be desirable to get up a sort of container code, including baskets and barrels for fruits and vegetables, in one comprehensive act. This suggestion was taken up with the Bureau of Standards, and, upon learning that that bureau was still willing to acquiesce in a proposal for the transfer of barrel laws to the Department of Agriculture, this idea was followed in the draft which I am going to ask you to consider with me.

Digitized by Google

Let us consider some of the weaknesses of the laws now on the statute books.

(1) The act of 1916 establishes in the first section standards for Climax baskets, for grapes and other fruits and vegetables; in the second section it establishes sizes for the standard basket or other container for small fruits, berries, and vegetables. Note that in the first section the phrase "grapes and other fruits and vegetables" is used, while in the third section the phrases are "small fruits, berries, and vegetables." The discrepancy in language may not appear to be important, but during the past year it had been made the basis for resisting the enforcement of the act. The question arises as to what is a small fruit. Horticulturalists tell us that the small fruits are berries, and that other fruits may be classed as tree fruits and vine fruits. The act, by mentioning both small fruits and berries, may seem to indicate that Congress had something else than berries in mind in speaking of small fruits. One Federal court, however, appears to take the opposite view.

(2) Section 3 of the act of 1916 is the penalty section. It provides a penalty for using nonstandard Climax baskets and other containers for small berries, fruits, and vegetables, making no mention of grapes which are specifically mentioned in the first section. Here again we have a technical point which has been made the basis of resistance to the act. The claim has been successfully made that since grapes are not specifically mentioned in section 3, there is no punishment for using any type or size of container for grapes.

(3) The act of 1916 is based on interstate commerce. It makes it unlawful to manufacture for shipment, sell for shipment, or ship in interstate commerce nonstandard containers. Obviously, a manufacturer in the State of Illinois may manufacture nonstandard Climax berry boxes or till baskets and ship them to Chicago without interference on the part of the Federal Government, whereas an Indiana manufacturer may not do so. The standard barrel law, and the act of 1928, on the other hand, are weights and measures laws and as such are effective in intrastate as well as interstate commerce.

(4) The act of 1916 nowhere mentioned specifically the standardization of till baskets. It is accomplished by providing that baskets and other containers must be made in the half-pint, pint, and multiples of the dry quart. This provision is somewhat inconsistent with the act of 1928, and it would be much better if the till baskets were specifically standardized.

(5) The act of 1928, as I have previously stated, may be construed as nullifying much that has been accomplished in bringing about the sale of fruits and vegetables by weight and numerical count.

(6) The old apple barrel law contained one section which established standard grades for apples when packed in barrels. So far as is known these grades have never been used to any extent, and the Department of Agriculture long ago recommended other and more specific grades for barreled apples. This act has to a great extent been superseded by the second barrel act of March 4, 1915, but was never repealed. Under present conditions its continuance on the statute books seems unnecessary and undesirable.

Digitized by Google

(7) The second barrel act does not prohibit the manufacture of nonstandard barrels for fruits and vegetables. It makes it unlawful to sell or to offer or expose for sale a nonstandard barrel when it contains fruits or vegetables. Experience has demonstrated that it is much easier to enforce a law of this character if it makes it possible to eliminate nonstandard containers at their source, namely, the manufacturer.

(8) None of these standard container acts contains a provision requiring the marking of containers to show the capacity and the identity of the manufacturer. The lack of any identification mark makes enforcement more difficult.

Having set forth some of the deficiencies which have caused a study to be made of the possibility of codifying container legislation, let us proceed to a brief review of our suggestions which have been put in the form of a bill. I first wish to emphasize the fact that this draft is not to be understood as proposed at this time by the Department of Agriculture. It represents the results of the study of the subject made by specialists in the Bureau of Agricultural Economics, as modified in some respects to meet suggestions made by representatives of the Bureau of Standards. It contains our present suggestions as to how weaknesses in existing acts might be corrected and existing container legislation placed upon a better basis. I do not know whether these views would receive the approval of the department, and I do not know whether the department would be willing to propose any further legislation on the subject. I am bringing these suggestions to your attention because I think you are entitled to know what we are thinking on the subject and because we should like to have the benefit of your experience and of any suggestions which you may wish to make. I shall be disappointed if those of you who are present here look on this as something regarding which we in the department have come to a definite and final agreement and upon which we are not open to suggestions. We have fretted and worried a great deal over this whole proposition and, perhaps somewhat selfishly, are now inviting you to fret and worry with us.

SECTION 1. That for the purposes of this act a bushel, standard dry measure, has a capacity of 2,150.42 cubic inches; a quart, standard dry measure, is ¼ of a bushel, or 67.2 cubic inches; a pint, standard dry measure, is ½ quart, or 33.6 cubic inches; and the standard containers established by this act, respectively, shall have capacities in cubic inches equal to the designated multiple or fractional part or combined multiple and fractional part of such standard bushel, standard quart and/or standard pint. The capactiy of any hamper or basket provided in this act shall be determined by stricken measure in accordance with the rules and regulations prescribed by the Secretary of Agriculture. If a cover be used upon any hamper or basket mentioned in this act it shall be securely fastened or attached in such manner, subject to the regulations of the Secretary of Agriculture, as not to reduce the capacity of such hamper or basket below that prescribed therefor.

This section sets forth the number of cubic inches in a bushel, a dry quart, and a dry pint, and provides that the standard containers set up by the act shall be of cubical capacities corresponding to their relation to the bushel, the quart, and the pint. This part of the section is new and was written in this way to meet a suggestion from the Bureau of Standards that the act could be much simplified if we abandoned the form used in the acts of 1916 and 1928 of setting forth the number of cubic inches for each container. This form

Digitized by Google

shortens the bill materially and we believe does not weaken it in any respect. The portions of the section providing for the determination of capacity by stricken measure and that any covers used must be so attached as to not reduce the capacity of the basket are not new.

SEC. 2. That the standard till basket for fruits or vegetables shall be of the following capacities, standard dry measure, namely, ½ pint, 1 pint, 1 quart, 2 quarts, 3 quarts, and 4 quarts.

This section establishes standard capacities for till baskets. This is new in form but not in the standards. The new feature consists in the elimination of all mention of berry boxes, classing them under the head of till baskets which is where they properly belong. Another new feature is the placing of a limit on the size of till baskets. Heretofore, under the act of 1916, a till basket could be made in any size, so long as it was a multiple of the quart.

SEC. 3. That the standard Climax baskets for fruits and vegetables shall be of the following capacities, standard dry measure, namely, 2 quarts, 4 quarts, and 12 quarts, respectively.

(*a*) The standard 2-quart Climax basket shall be of the following dimensions: Length of bottom piece, 9½ inches; width of bottom piece, 3½ inches; thickness of bottom piece, ⅜ inch; height of basket, 3⅞ inches, outside measurement; top of basket, length 11 inches and width 5 inches, outside measurement. Basket to have a cover 5 by 11 inches, when a cover is used.

(*b*) The standard 4-quart Climax basket shall be of the following dimensions: Length of bottom piece, 12 inches; width of bottom piece, 4½ inches; thickness of bottom piece, ⅜ inch; height of basket, 4⅛ inches, outside measurement; top of basket, length 14 inches, width 6¼ inches, outside measurement. Basket to have cover 6¼ inches by 14 inches, when cover is used.

(*c*) The standard 12-quart Climax basket shall be of the following dimensions: Length of bottom piece, 16 inches; width of bottom piece, 6½ inches; thickness of bottom piece, 7/16 inch; height of basket, 7 7/16 inches, outside measurement; top of basket, length 19 inches, width 9 inches, outside measurement. Basket to have cover 9 inches by 19 inches, when cover is used.

This merely repeats section 1 of the present act of 1916.

SEC. 4. That the standard hampers, round stave baskets and straight-side baskets for fruits or vegetables shall be of the following capacities, standard dry measure, namely, ⅛ bushel, ¼ bushel, ½ bushel, ⅝ bushel, ¾ bushel, 1 bushel, 1¼ bushels, 1½ bushels, and 2 bushels.

SEC. 5. That the standard splint basket for fruits or vegetables shall be of the following capacities, standard dry measure, namely, 4 quarts, 8 quarts, 12 quarts, 16 quarts, 24 quarts, and 32 quarts.

Sections 4 and 5 contain practically the same matter as that appearing in the first paragraphs of sections 1 and 2 of the act of 1928. The sections are made much shorter because section 1 of the draft makes possible the elimination of the paragraphs relating to the cubical content of the individual baskets.

SEC. 6. That the standard barrel for fruits or vegetables and other dry commodities other than cranberries shall contain 7,056 cubic inches and be of the following dimensions without distension of its parts: Length of stave, 28½ inches; diameter of heads, 17⅛ inches; distance between heads, 26 inches; circumference of bulge, 64 inches, outside measurement; thickness of staves, not greater than 1/16 inch: *Provided*, That any barrel of a different form having a capacity of 7,056 cubic inches and which is not deceptive in appearance shall be a legal barrel. The standard barrel for cranberries shall contain 5,826 cubic inches and be of the following dimensions when measured without distension of its parts: Length of staves, 28½ inches; diameter of heads, 16¼ inches; distance between heads, 25¼ inches; circumference of bulge, 58½ inches, outside measurement; thickness of staves, not greater than 1/16 inch: *Provided*, That in barrels having but one head and no croze ring or other means for the insertion of a head at the opposite end, the distance between heads shall be meas-

Digitized by Google

ured perpendicularly between the one head and a plane 1⅛ inches from the end of the staves at the opposite end.

The standard subdivisions of the standard barrel for fruits or vegetables and of the standard cranberry barrel shall be the ¾ barrel, ½ barrel, and the ⅓ barrel, respectively, the dimensions of which shall be prescribed in the regulations to be promulgated by the Secretary of Agriculture.

The first paragraph of this section contains the same material as that found in section 1 of the standard barrel law of 1915. It has, however, one addition; that is, the proviso at the end of the paragraph which reads: "*Provided*, That in barrels having but one head and no croze ring or other means for the insertion of a head at the opposite end, the distance between heads shall be measured perpendicularly between the one head and a plane 1⅛ inches from the end of the staves at the opposite end." This proviso was inserted at the suggestion of those in the Bureau of Standards who have had to do with the enforcement of the barrel law, as being desirable.

The second paragraph of section 6 establishes the subdivisions of the standard barrels which now appear in section 2 of the act of 1915. These subdivisions have been the subject of some discussion and it does not appear that any great use has ever been made of any of them. Cranberries are now packed in boxes or cartons which represent subdivisions of the barrel, but the only one of the subdivisions here mentioned which is used is the half-barrel. The quarter-barrel box is used, as is also an eighth-barrel carton. However, in the absence of any comments either for or against the present arrangement it was deemed advisable to continue it.

SEC. 7.—That no person shall manufacture till baskets, hampers, round stave baskets, straight-side baskets, splint baskets, or barrels for fruits or vegetables unless the dimension specifications for such till baskets, hampers, round stave baskets, straight-side baskets, splint baskets, and barrels shall have been submitted to and approved by the Secretary of Agriculture who is hereby directed to approve such specifications if he finds that till baskets, hampers, round stave baskets, straight-side baskets, splint baskets, and barrels made in accordance therewith would not be deceptive in appearance and would comply with the provisions of sections 2, 4, 5, and 6 of this act. The provisions of this section shall not apply to barrels for fruits and vegetables which conform to the standard dimensions set forth in section 6 of this act.

This is a rewriting of section 4 of the standard container act of 1928. It has some wording that is new and which is intended to strengthen the requirement that specifications be submitted to and approved by the Secretary of Agriculture. It may be noted that it directs the Secretary to approve specifications if they would not be deceptive in appearance and would comply with the provisions of sections 2, 4, 5, and 6 of the act, and then goes on to exempt barrels which conform with the standard dimensions set forth in section 6. Reference to section 3 of this bill is omitted because it relates to Climax baskets and establishes standard dimensions therefor. Barrels conforming to standard dimensions set forth in section 6 are exempt for the same reason.

SEC. 8. That till baskets, Climax baskets, hampers, round stave baskets, straight-side baskets, splint baskets, and barrels for fruits or vegetables shall be plainly marked by the manufacturer to show the identity of the manufacturer and the capacity of the container. Such marking shall be in accordance with the regulations prescribed by the Secretary of Agriculture.

This is an entirely new section and one in which I believe you will all be interested. It is one requiring the marking of fruit and

Digitized by Google

vegetable containers by the manufacturer to show his identity and the capacity of the container. There was a time when manufacturers would have objected strenuously to such a provision. In fact, it was such objections which caused the elimination of a provision of this character from the act of 1928 at the time it was under discussion in Congress. I believe now, however, that the great majority of manufacturers will support such a proposition. I believe you will all agree that it is desirable.

SEC. 9. That it shall be unlawful to manufacture, to offer for sale, to sell, to offer for shipment, to ship or to use till baskets, Climax baskets, hampers, round stave baskets, straight-side baskets, splint baskets, and barrels for fruits or vegetables, either filled or unfilled, or parts of such containers, that are not of the capacities and/or dimensions specified by this act, or for which the dimension specifications have not been submitted for approval or approved as provided by this act, or which do not conform to the specifications approved therefor as directed by this act, or which have not been marked as provided by this act.

This section may be described as defining illegal containers. It makes it unlawful to manufacture, to offer for sale, sell, to offer for shipment, to ship or to use containers not of the capacities and/or dimensions specified by the act or for which the dimension specifications have not been submitted for approval or approved as provided by the act, or which do not conform with the specification approved therefor directed by this act, or which have not been marked as provided by this act. Please note that in existing laws it has been declared unlawful to manufacture for sale or for shipment thus making it necessary to prove that the manufacturer actually did make the goods for sale or shipment. Some may allege that the proposed provision is too harsh. Certainly, if a manufacturer makes any quantity of illegal containers he must have made them only for sale or for shipment and it is throwing needless obstacles in the way of enforcement to require that it be proved that he manufactured them for such a purpose. This provision is more stringent than any now existing in that it clearly makes illegal the manufacture of containers which do not conform to approved specifications or the specifications for which have not been submitted and approved. This was the plain intent of the act of 1928, but the act did not specifically so state, and it is questionable whether it could be enforced along such lines. Lawyers differ in their opinions on the point and it seems well to clear it up. Since marking is incorporated in this draft, it is, of course, necessary to make unmarked containers illegal.

SEC. 10. That, except as provided in section 15 of this act, any person who violates any of the provisions of this act shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine not exceeding $500: *Provided, however,* That no person shall be prosecuted under the provisions of this act when he can establish a guaranty signed by the manufacturer, wholesaler, shipper, or other party residing within the United States from whom the containers as specified in this act, or parts thereof, were purchased, to the effect that said container or parts thereof are correct within the meaning of this act. Said guaranty, to afford protection, shall contain the name and address of the party or parties making the sale of the containers or parts thereof to such person, and in such case such party or parties making such sale shall be amenable to the prosecution, fines, and other penalties which would attach in due course under the provisions of this act to the person who made the purchase.

Digitized by Google

This is the penalty section. We have followed a little different system here. The matters appearing in sections 9 and 10 of this draft have formerly been combined in one section. It is believed that the present method makes greater clearness.

SEC. 11. That any till basket, Climax basket, hamper, round stave basket, straight-side basket, splint basket, or barrel for fruits or vegetables, whether filled or unfilled, or parts of such containers that are not of the capacities and/or dimensions specified by this act, or for which the dimension specifications have not been submitted for approval or approved as provided by this act, or which do not conform to the specifications approved therefor as directed by this act, or which have not been marked as provided by this act which shall be manufactured, offered for sale, sold or shipped, or which shall be used contrary to the provisions of section 12 of this act, may be proceeded against in any district court of the United States within the district where the same shall be found and may be seized for confiscation by a process of libel for condemnation. Upon request the person entitled shall be permitted to retain or take possession of the contents of such till baskets, Climax baskets, hampers, round stave baskets, straight-side baskets, splint baskets, or barrels, but in the absence of such request, or when the perishable nature of such contents makes such action immediately necessary, the same shall be disposed of by destruction or sale, as the court or a judge thereof may direct. If such till baskets, Climax baskets, hampers, round stave baskets, straight-side baskets, splint baskets, or barrels, or parts thereof, be found in such proceeding to be contrary to this act, the same shall be disposed of by destruction, except that the court may by order direct that such containers, or parts thereof, be returned to the owner thereof or sold upon payment of the costs of such proceedings and the execution and delivery of a good and sufficient bond to the effect that such containers, or parts thereof, shall not be sold or used contrary to law. The proceeds of any sale under this section, less legal costs and charges, shall be paid over to the person entitled thereto. The proceedings in such seizure cases shall conform as near as may be to the proceeding in admiralty, except that either party may demand trial by jury of any issue of fact joined in such case, and all such proceedings shall be at the suit and in the name of the United States.

This is the seizure section of the act of 1928. The only difference is that this section gives specific permission to seize baskets which are not of the dimensions specified by the act or for which the dimension specifications have not been submitted for approval or have not been approved or which have not been marked as provided by the act. I might say there that some of you might think we are trying to be a little severe in this matter of submitting specifications for approval, but our experience in the past three years with the act of 1928 convinces us that we need a little more stringent provision along this line not only to make enforcement easier for us but to protect the manufacturer who does cooperate against the manufacturer who does not cooperate readily.

SEC. 12. That till baskets, Climax baskets, hampers, round stave baskets, straight-side baskets, splint baskets or barrels, which do not comply with this act shall not be used for fruits or vegetables, and that standard till baskets, Climax baskets, hampers, round stave baskets, straight-side baskets, splint baskets or barrels, which do comply with this act shall not be used by any retailer for the determination of the quantity of fruits or vegetables sold at retail unless such fruits or vegetables were received therein by him and/or unless such retailer is the producer or grower of the fruits or vegetables so sold: *Provided*, That this act shall not prohibit the manufacture, offer for sale, sale, or shipment of till baskets, Climax baskets, hampers, round stave baskets, straight-side baskets, splint baskets or barrels, or parts thereof, to any foreign country in accordance with the specifications of a foreign consignee; nor shall this act prevent the manufacture or use of banana hampers of the shape and

Digitized by Google

character now in commercial use as shipping containers for bananas, nor of barrels used in packing commodities sold exclusively by weight or numerical count.

This is an entirely new section and the one which I think will probably be of greatest interest to this conference. This is the section which has been devised in an attempt to make it very sure that the provisions of standard container legislation shall not interfere with State laws or city ordinances respecting the sale of fruits and vegetables by weight. We have had more trouble with this section than with all the rest of the bill put together. Messrs. Holbrook, Smith, Carey, and I have all fussed around with this section and our efforts have been submitted to Mr. Lees, of the office of the Solicitor of the Department of Agriculture. None of us are altogether satisfied with the result. As a matter of fact, I can not tell you very definitely just who is to be praised or blamed for the section as it stands. My recollection is that it was written by Carey, revamped by Smith, and revised by Lees, with Holbrook and I as more or less innocent but hopeful bystanders. What we had to do was to write a section which would in no way nullify or weaken the standard container legislation and which at the same time would in no way nullify or weaken what you gentlemen have accomplished in bringing about sale by weight. The problem sounds very simple; we did not find it at all so, and if any of you gentlemen can suggest a wording which accomplishes the result more securely and more definitely and in smoother and more understandable language, we shall welcome your suggestion with open arms. I ask your serious and careful consideration of this section. It is one which is even more important to you than it is to us and one on which I think we are entitled to well-considered and well-thought-out advice.

SEC. 13. That the examinations of samples of hampers, baskets, and barrels mentioned in this act shall be made by the Department of Agriculture or under the direction and supervision of such department, for the purpose of determining from such examinations whether such hampers, baskets, or barrels comply with the provisions of this act; and if it shall appear from such examination that any of the samples is not in compliance with the act, the Secretary of Agriculture shall cause notice thereof to be given to the party from whom such samples were obtained. Any party so notified shall be given an opportunity to be heard under such rules and regulations as may be prescribed, and if it appears that any of the provisions of this act have been violated by such party, then the Secretary of Agriculture shall at once certify the facts to the proper district attorney, with a copy of the results of the examinations and tests of such samples duly authenticated by the person making the tests, under the oath of such person.

This section provides for examinations and tests of baskets and for the holding of hearings in case baskets are found not to comply with the act. The portion relating to examinations and tests is not new, but is made somewhat more specific. That relating to the holding of hearings is entirely new. It has been put in because some of the other portions of the act are more stringent than they have been heretofore. If this draft were to be accepted, it would be possible to proceed immediately against any manufacturer who submitted samples which were found unsatisfactory, unless the manufacturer's interests were safeguarded as provided in this section. It should be understood that opportunity for such a hearing must be granted only when the samples submitted as the result of call by the Secretary are

Digitized by Google

found to be not of standard capacity. It is believed that a provision such as this will result in obtaining quicker rectification of nonstandard forms by manufacturers than the mere threat of prosecution.

SEC. 14. That the Secretary of Agriculture may require manufacturers to report annually the number of each size and type of till baskets, Climax baskets, hampers round stave baskets, straight-side baskets, splint baskets and barrels for fruits or vegetables manufactured by them, and shall cause such examinations and tests to be made as may be necessary to determine whether such till baskets, Climax baskets, hampers, round stave baskets, straight-side baskets, splint baskets and barrels, or parts thereof, subject to this act, meet its requirements, and may take samples of such containers, and/or require such samples or parts thereof to be submitted to him. Failure to report the quantities of such containers manufactured within 60 days following notification by the Secretary of Agriculture by mail, or to submit samples of such containers in compliance with this section, or to furnish adequate explanation for such failure, within 15 days following notification by the Secretary of Agriculture by mail, shall constitute a misdemeanor and be punishable by a fine of not less than $50 nor more than $100.

This is another section which is entirely new. It makes two requirements—one, the submission of annual production reports, and, second, the submission of samples when required by the Secretary. It further provides for a punishment for failure to submit production reports and samples. The department has for several years given out a production and carry-over report This has been purely voluntary, and while we have been able to get reports from a great majority of manufacturers, the report is not as complete as it should be. That, however, is not the reason for requiring the making of reports. The reason it is essential that we know who is making various types and sizes of containers and how many are being made, is to assist us in the enforcement of the act. Obviously, it would be much more easy to enforce the law if we could require the making of this report. We have had instances where manufacturers have failed to report the making of a certain size and type of container and have found out later that they have been making this size and type for some time without securing the approval of our office.

We have had even more trouble as a result of failure of manufacturers to supply samples when requested. We attempt to obtain samples of a given type of basket from all manufacturers of that type throughout the country and to make a test of these during a given production season. We have had trouble with manufacturers either carelessly or wilfully neglecting to send a sample as asked, with the result that the current production season passes and it is time to take up tests of another type of containers. Our work can be made very much more valuable and more efficient if we have some way of requiring the submission of samples.

SEC. 15. That the Secretary of Agriculture shall make uniform rules and regulations for carrying into effect the provisions of this act, including such definitions as may be necessary and prescribing a method of testing till baskets, Climax baskets, hampers, round stave baskets, straight-side baskets, splint baskets, and barrels and for such tolerances as may be necessary to provide for reasonable variations occurring in the course of manufacturing and handling such containers; and providing a manner or style of marking such containers, including the authorization of properly accredited identification numbers to be used in lieu of or in conjunction with manufacturers' names and addresses; and providing also for the manner and time of reporting the quantities of such containers manufactured.

Digitized by Google

This is the customary section conferring on the Secretary the authority to make rules and regulations but is new in that it directs the Secretary to provide the manner or style of marking such containers, including the authorization of properly accredited identification numbers and also it authorizes regulation as to the manner and time of reporting production by manufacturers.

SEC. 16. That it shall be the duty of each United States district attorney to whom satisfactory evidence of any violation of this act is presented to cause appropriate proceedings to be commenced and prosecuted in the proper courts of the United States in his district for the enforcement of the provisions of this act.

SEC. 17. That for carrying out the purposes of this act the Secretary of Agriculture is authorized to cooperate with State, county, and municipal authorities, manufacturers, dealers, and shippers, to employ such persons and means, to collect statistical data on production and distribution of containers for fruits and vegetables, and to pay such expenses, including rent, printing, binding, telegrams, telephones, books of reference, publications, furniture, stationery, office equipment, travel, and other supplies and expenses including reporting services, as shall be necessary to the administration of this act in the District of Columbia and elsewhere, as may be appropriated for by the Congress; and there is hereby authorized to be appropriated out of any money in the Treasury not otherwise appropriated such sums as may be necessary for such purposes.

Sections 16 and 17 are customary sections placed in all Federal acts of this character.

SEC. 18. That an act to establish a standard barrel and standard grades for apples when packed in barrels, and for other purposes (37 Stat., ch. 273, p. 250) and an act to fix the standard barrel for fruits, vegetables, and other dry commodities (38 Stat., ch. 158, p. 1,186) and an act to fix standards for Climax baskets for grapes and other fruits and vegetables and to fix standards for baskets and other containers for small fruits, berries, and vegetables and for other purposes (U. S. C. title 15, sec. 251–256) and an act to fix standards for hampers, round stave baskets and splint baskets for fruits and vegetables, and for other purposes (U. S. C. title 15, sec. 257) are hereby repealed.

Section 18 definitely and specifically repeals the two barrel laws now on the books and the standard container acts on 1916 and 1928.

I commend these suggestions to you for study and discussion. They have been put in the form of a bill merely for convenience in comparing them with existing laws. I realize there is much in them to which many of you may have given but little thought. I am hoping that as a result of our discussion here to-day you may be induced to give them constructive consideration. As I have said before, we want the benefit of your advice and of your experience. If there are other defects in existing laws which we have overlooked, we should like to have them brought to our attention. We should like to know how you feel regarding these suggestions and how you feel regarding the necessity of correcting some of the evils at which they are aimed.

Coupled with consideration of possible changes in the laws should be thought along the lines of some of the containers which various people are seeking to make, differing from the standards set up by present laws. The principal one of these is the so-called 9-basket crate. California has for years used a crate holding four 3-quart till baskets, these baskets being square in shape. There has been devised a basket of such a size that 9 of them will fit this crate, each basket holding but a quart and a third. This basket was used to some extent last season and, as a result of its use, two suits were brought

Digitized by Google

by the Federal Government, one involving a shipment of plums and the other a shipment of grapes. The Government lost both of these suits on the ground that the section of the container act of 1916 applying to till baskets related only to small fruits and berries, whereas neither plums nor grapes are considered by horticulturalists to fall within the category of small fruits.

One of the arguments put up by the gentleman who devised this package is that the nine 1⅓-quart baskets hold 12 quarts, which was the combined capacity of the four 3-quart baskets originally used in this crate. This argument is, of course, entirely illogical, as there never was any standardization of the crate in question on the basis of capacity.

However, the principal argument which this manufacturer makes is economic. So far as shipment of grapes is concerned the 4-basket crate was used largely for the Thompson seedless grapes, and the manufacturer claims that it was finally found to be unsatisfactory for this particular variety. He states also that when packed in lugs many of the grapes shatter and fall to the bottom of the lug and represent a dead loss to the retailer. He contends that when packed in these small containers, even if some of the grapes shatter they remain in the container and are sold to the consumer, the retailer not suffering the loss. He makes a further contention that a popular chain-store price is 25 cents and that these 1⅓-quart baskets make a convenient size package to sell for that price.

The assertions made by the proponents of this package are interesting and, if true, are very important; they have not, however, so far produced any concrete evidence to back up their assertions. Our own representatives in various cities have submitted some very interesting opinions from different members of the trade, but we have as yet nothing which we feel conclusive, although the reports received from our representatives are not altogether favorable to this container.

This situation provides plenty of food for thought. Is it true that economic conditions demand the introduction of new packages of this sort? If we grant this, what packages are we to look on as proper and what are we to condemn? I think that we will all admit that we can not stop with the introduction of only one package if there is a genuine economic need for a change of this sort.

The statement has been made by those favoring such packages that the contents will be sold by weight and some of the samples which we have received have had the weight printed on the container. I think that all of us will agree that it is extremely difficult for a grower of grapes or plums or some other commodity in California, to guarantee the delivery of any given weight to a housewife in Pittsburgh or New York. If there are gentlemen here from Pittsburgh or New Jersey I think their experience with potatoes in 15-pound sacks will enable them to tell you that the proposition is not quite as simple as it may seem.

Another suggestion which the advocates of this package have made is that they would be willing to increase the size from 1⅓ quarts to 1½ quarts, urging that 1½ quarts would be a proper size to add to existing standards. They make a point that we now recognize the pint or half quart and the quart and to include the 1½ quart would

Digitized by Google

be merely recognizing again that the half quart is a proper subdivision. To you who are familiar with deceptive measures of all sorts, I do not need to point out how fallacious this argument is. I need only to call attention to the fact that the difference between a pint and a quart is 50 per cent of the larger size, while the difference between 1½ quarts and 2 quarts is but 25 per cent of the larger size. If we admit the half quart as a proper basis for subdivisions between multiples of the quart, then there would be no logical argument against a 2½ quart or a 3½ quart. The difference between a 2½ and a 3 quart package would be but 16⅔ per cent of the larger size and between a 3½ and a 4 quart package but 12½ per cent of the larger size.

It seems to me that the final decision in a matter of this kind may rest with the housewife. Is she going to be pleased with a small package of grapes which has many shattered grapes in the bottom or does she prefer to buy bunches which are intact? We expect during the summer to make an effort to obtain some information along these lines and I want to bespeak the assistance of you gentlemen in that endeavor. If you have an opportunity to make any observations as to the sale of this package and as to the reaction of the trade and of the housewife to the package, we shall be very glad to have them. Some of you will be interested in the container because of the fact that it violates your State laws or city ordinances and this probably will give you the opportunity of obtaining for us information which we greatly need.

In considering this question, I ask you to bear in mind that acquiescence in changes of this sort implies an abandonment of the present basis of standardization of fruit and vegetable containers and the substitution therefor of some other basis. I do not feel that we should take the position that a standard once agreed upon or set up by legislation should never be subject to change. I do feel, however, that changes should be made only for good and sufficient reasons and that when a change is made involving the abandonment of one basis of standardization then we should have some idea as to a new basis before we abandon the old one.

Another container which is suggested as an addition to the standard is a 6-quart Climax basket. This proposal has come in from the Northwest and apparently grew out of the fact that the 6-quart is one of the standard sizes in the Dominion of Canada. Apparently those suggesting the container as one of our standards have not given thought to the fact that the Canadian 6-quart Climax basket is standardized on the basis of the Imperial quart and consequently is 12¾ cubic inches larger than would be a standard 6-quart Climax basket in this country. In other words, the Canadian basket would be too large to be considered standard here and I presume that our basket would be too small to be considered standard in Canada.

However, the important question here is whether there is a need for a size intermediate between the 4-quart and the 12-quart; and, if so, what that size should be. Some think that it would be more logical to make an even division and provide the 8-quart as an intermediate size if one is necessary. It is a matter of container history that when the manufacturers of Climax baskets were deciding what sizes they would ask for as standards a rather heated argument arose

Digitized by Google

as to whether the largest size should be the 8-quart or the 12-quart. The theory which they followed was that the 2 and 4 quart sizes would provide the packages for table stock, and that the 12-quart size would provide a package for juice stock and for purchases which the housewife might wish to make for preserving purposes. For this reason they felt the size between the 4 and 12 quart to be unnecessary; some Northwest parties now believe that an intermediate size is necessary. This is another question which we expect to investigate this summer and on which we should like to have the benefit of any suggestions you may wish to make or any information you may be able to supply.

Gentlemen, I have taken up a great deal of your time in discussing this subject. I should like to commend it to your consideration, particularly section 12, which as I endeavored to point out is intended to correct an evil which no one anticipated when the act of 1928 was passed.

DISCUSSION OF ABOVE PAPER

The CHAIRMAN. Gentlemen, this presentation by Mr. Spilman of the situation over the country is evidently of the greatest importance to all weights and measures officials on the one hand and the manufacturers of containers on the other. I am sure that I express the sentiment of the conference in saying we appreciate Mr. Spilman's presentation of this very complex subject, and we are also indebted to him for the excellent exhibit which he has been kind enough to bring with him.

We are all interested in this matter and in any legislation which may ultimately be enacted. You are in a position either in this conference, or after you go home, to speak or write to Mr. Spilman, or to the Bureau of Standards, and express your ideas. As Mr. Spilman says, the Agricultural Department will welcome any suggestions.

I might state what the attitude of the Bureau of Standards is in regard to this container question. It has been the policy of the bureau and staff not to seek for police power. There has been set up in the Department of Agriculture a most admirable jurisdiction in regard to the matter of containers, and we consider it wise to have a single jurisdiction rather than a divided jurisdiction.

Now, gentlemen, the matter is before you for discussion and questions. I am sure many of you have questions to ask and suggestions that you would like to make.

Mr. COVILLE. I would like to ask Mr. Spilman if the manufacturer is required to stamp his name on the basket?

Mr. SPILMAN. Not at the present time. We do have regulations under the act of 1928 whereby we have provided a method of marking and have assigned identification numbers, and some are using it, but it is purely voluntary.

Mr. SWEENEY. Mr. Chairman, I would like to ask Mr. Spilman a question. The preamble to the proposed bill reads:

> A bill to fix standards for till baskets, Climax baskets, hampers, round stave baskets, straight-side baskets, splint baskets, barrels, and other containers for fruits and vegetables, and for other purposes.

Digitized by Google

I was wondering if the words "other containers" are broad enough to interfere with the standard bushel that we are using. We have a standard farm bushel in Massachusetts. I was wondering if this could have any control over that.

Mr. SPILMAN. It would not. Lawyers tell us that those words are to be construed as meaning other containers similar to those already mentioned. They were put in there to get some one who is trying to evade the law.

Mr. MEREDITH. Mr. Chairman, the comments and statements of Mr. Spilman are so clearly conservative and constructive, and yet so voluminous, that it is scarcely possible, according to my personal view to express much of an opinion at this time. Undoubtedly there is a great deal of value in the paper, and it is possible that it is one of the most important papers that we have yet listened to in conference.

I, perhaps, am inclined to feel that it would show a lack of appreciation to remain silent and make no comment, which would be in the direction of discouragement. I seriously hope that the opportunity will be afforded to have a sufficient number of copies of the paper so that we may take it home and give it that serious and careful consideration which is evidently sought for. I know of no subject at the present time to which we can devote more serious attention. I can not attempt to analyze it, but I feel that such a paper warrants our hearty support, with the heartiest cooperation.

Mr. TINKEY. Mr. Chairman, we have not been enforcing our State law as we should; but just recently we had some conflict with a market master of the State, and he insists that our present Federal law annuls all of the sales-by-weight laws whether commodities are in those containers or not. Just last week after a conference our director of agriculture called in a circular which he was about to issue over the State. He withheld it until I return from this conference. What I would like to know particularly is, when would be the earliest possible time that this proposed law as enacted would be in force and effect, so that we could use it in the different States?

Mr. SPILMAN. The earliest possible time it could be introduced in Congress would be about next December 1. You can not tell how long it will take those gentlemen to act. I would say the earliest possible time for the taking effect of the act would be the 1st of July, 1932, and my past experience with Congress has been such that I question whether it will be passed so quickly.

Mr. TINKEY. Then, in the meantime, the best thing we can do is to get along the best we can.

Mr. SPILMAN. I would not say the best thing you can do would be to do that, but rather to do constructive work toward the introduction of legislation correcting that situaion.

Mr. SWEENEY. Why is there a distinction between the standard barrel and the cranberry barrel? Why make two barrels?

Mr. SPILMAN. I do not know whether I ought to answer that, or Mr. Holbrook. It is my understanding that the cranberry people marketed 100 pounds of cranberries in a barrel. They called it 100 quarts. This barrel does not hold 100, but 86 and a fraction, but they asked that their barrel be recognized and Congress thought fit to do so.

Digitized by Google

The CHAIRMAN. I would like at this time to ask the Hon. Philip H. Dewey, secretary of internal affairs of the State of Pennsylvania, to rise and make a remark or two.

REMARKS BY HON. PHILIP H. DEWEY, SECRETARY OF INTERNAL AFFAIRS, STATE OF PENNSYLVANIA

Mr. President, and ladies and gentlemen of the convention, I have only been in the office for a few days and I am not here to tell you people how to carry on the work with which you are familiar. I want to assure you that we will be very willing to cooperate and will try to be helpful in carrying on the work you have in hand. I realize how important to the manufacturer, to the distributor, and to the consumer are matters you are talking about here to-day.

How much better milk tastes out of a bottle sealed at the source of that product; how much better honey, butter, apples, and other fruits look when put up in a nice container. I want to tell you this incident that happened up in my State of Pennsylvania. A young man on a "two by four" farm with a few apple trees conceived the idea that if he rubbed his apples with a cloth suitable for that purpose, and put them in little paper containers labeled with his name and address, when they were offered for sale on a fruit stand in a city like New York, the people would even find where Homer Howe lived, in Tioga County. This attracted the attention of Governor Sproul, with the result that he put Mr. Howe in charge of all his farms in Pennsylvania; the last I knew he was still in that business, looking after Governor Sproul's estate, because he had foresight enough to see that if he rubbed his apples well and put them in just a simple container he would draw a market. We all attend the market in our own city and we know that the little booths that have these attractive containers and give good measure get along best almost always.

The CHAIRMAN. I wish to take this opportunity of extending to the next speaker on our program an official welcome to this conference. It is a source of gratification for all of us, I am sure, to have present a representative of the national organization having charge of the administration of weights and measures in the Dominion of Canada, who will tell us something of how that work is carried on across the border. E. O. Way, Director of the Weights and Measures Inspection Service of Canada, was unable to be present at our meetings, but he has been good enough to prepare a paper and to arrange for the attendance of his principal assistant and "second in command" to present this paper to us. It is a pleasure for me to introduce to you D. J. McLean, Superintendent of the Weights and Measures Inspection Service of Canada.

THE ADMINISTRATION OF WEIGHTS AND MEASURES IN CANADA [1]

By E. O. WAY, *Director, Weights and Measures Inspection Service, Department of Trade and Commerce of Canada*

In reading this paper on Canadian weights and measures, which has been prepared by our director, Mr. Way, at Ottawa, he wishes

[1] In the absence of Mr. Way, this paper was read to the conference by D. J. McLean, Superintendent, Weights and Measures Inspection Service of Canada.

Digitized by Google

me to say that it gives him much pleasure to comply in this way with a request from your secretary, Mr. Holbrook, from whom we have received many valued and valuable courtesies, and his one hope is that we shall not betray the confidence Mr. Holbrook has shown in inviting us to address this conference.

Every year the world is growing smaller and international contacts more intimate. Millions of Americans have made personal contact with Canada since the advent of the motor car, and many of them no doubt have come to the conclusion that Canadians are mighty fine people since they get more miles out of a Canadian gallon of gasoline than they do at home. Some, of course, are more interested in pints and half pints, and these find our liberality and our liberty as large as our gallon, to their personal delectation!

There are no doubt quite a few in this gathering (and I have already met some of them) who are more or less familiar with Canadian weights and measures through the marketing of weighing and measuring equipment across the line, a marketing that is quite extensive, not to say aggressive, and unhappily not as reciprocal as many of us in the north could wish. The names of many of your manufacturers of weighing and measuring devices and their products are as familiar to us as to our friends in the South, but we are happy to say that few manufacturers gives us less trouble than those of this inventive and mechanistic paradise, and that despite the fact that under Canadian standards we are fairly strict, we are neither unfair, foolish, nor fussy. I think nearly every American manufacturer submitting devices and machines to Ottawa for approval will do us the honor of endorsing that modest assertion.

Turning now more directly to the subject assigned to us—Canadian System and Administration of Weights and Measures—I might say at the outset that it is a Federal service, administered under a Federal act under the Federal Department of Trade and Commerce. The whole staff from the director to the furthermost inspector are Federal civil servants, permanent in their appointments under the civil service act.

That was not always the case. Prior to confederation, which took place in 1867, Upper and Lower Canada—in fact, all the Provinces as they were created—had charge of and administered their own weights and measures inspection and possessed their own sets of standards—copies, of course, of the British standards.

From the lessons to be learnt from history, the fathers of confederation no doubt saw the light, and amongst many wise enactments decided that the needs of the Dominion for uniformity in weights and measures should be assured by making the control of the standards of weights and measures a Federal responsibility.

That decision was embodied in our principal weights and measures act of 1872, the provisions of which followed closely the English legislation of the day. The standards adopted, of course, were the British standards, including the imperial gallon.

There was, however, one very important modification made in the legal series of weights. The old English series of 1, 2, 4, 7, 14, 28, and 56 pounds was discarded in favor of our present simpler and decimalistic series of 1, 2, 3, 5, 10, 20, 30, and 50 pounds with a hundredweight of 100 pounds and the short ton of 2,000 pounds.

Digitized by Google

This made the pound and its multiples the sole basis of weight in Canada and freed the country from all entangling alliances with such hoary anachronisms as the 14 pound stone, the 112 pound hundredweight, and that galaxy of historical customary weights and measures concerning which our metric friends do so love to make fun.

Under this principal weights and measures act of 1872, then, all the Provinces gave up all local authority over weights and measures. Administration was assigned to the then Department of Inland Revenue, and the commissioner went to England for consultation with the standards department of the Board of Trade, London, and to arrange for the purchase of new sets of primary standards, including the avoirdupois pound and troy ounce in platinum iridium, the yard in Bailey's metal, the imperial gallon and the bushel, and a copy of the meter and the kilogram. Incidentally the act made the metric system legal and permissive for all purposes.

Three sets of these primary standards were obtained. One set each was placed in the custody of the Speaker of the Senate and the Speaker of the House of Commons and one in the custody of the Minister of Inland Revenue.

Sets of departmental standards in brass, complete in pounds, ounces, drams, and grains, in kilograms and grams, were also obtained as the working standards of the department and for equipping the local offices situated in the business centers of the country.

I might mention here that the original meter was a copy of the metre des archives, but it has recently been replaced and superseded by a nickel bar of H section, which is a copy of the international meter, with which it was compared and verified in June, 1924, at the International Bureau of Weights and Measures, France; and reverified again in the fall of 1929.

Nevertheless, the primary standards of Canada are the standards of the English system. They have their values, of course, with reference to the standards of the metric system, but they are the de facto standards of the Dominion and not merely functions of the metric standards.

For trade we have the simplified English avoirdupois system, with the metric system legal for all who care to use it, but very few seem to take advantage of that golden opportunity.

For gold and silver, we have the troy ounce with its decimal multiples and submultiples, and the carat, now equal to 200 milligrams for precious stones. There are, however, many jewelers who still use the historical pennyweight, so strongly does custom persist.

There is, of course, no troy pound, which was abolished in England in 1857, due to its confusion and substitution, when it furthered the merchants' profits, for the larger avoirdupois pound.

As regards measures of capacity, the Canadian system is identical with that of England and is based upon the imperial gallon of 277.274 [1] cubic inches and equivalent to 10 pounds of water at 62° F.

It is also worth noting that, unlike the United States, dry and liquid measure are the same in England and Canada; that is to say,

[1] The latest equivalent of the imperial gallon as determined by the National Physical Laboratory, England, is given as 277.420 cubic inches.

Digitized by Google

the dry pint, quart, and gallon are of the same volume as the liquid pint, quart, and gallon, whilst the bushel in volume is equal to 8 liquid gallons; that is, 2,218.19 cubic inches.

The United States liquid gallon equals 231 cubic inches and eight times that equals 1,848 cubic inches, but the bushel itself has a volume of 2,150+ cubic inches.

In measures of capacity, then, the Canadian system is simplicity itself compared with the double and unrelated series of the United States.

The wine gallon as used in the United States was abolished in England in 1824, over 100 years ago.

The gallon and its derivatives represent the most unlucky divergence between the weights and measures of the United States and Canada, and, for that matter, the whole British Empire.

If the situation in Canada is any criterion, this volumetric confusion must give many American producers and packers a great deal of trouble with their export trade. One of our most persistent causes of trouble is the shipment into Canada of American goods marked in United States measure. The United States pint, quart, and gallon are not only illegal measures for trade, their use and sale punishable by fine, but it also involves the double offense of short measure, since the American pint is approximately 16 per cent smaller than the imperial or Canadian pint.

Commodities, of course, can be invoiced and shipped into Canada by wine measure, but the individual wine-measure package can not be legally resold unless remarked five-sixth pint, quart, or gallon, as the case may be, the Canadian equivalent.

Incidentally we read a good deal from time to time about some hypothetical difference between the American and the English yard. Washington it seems, in the pursuit of its very valuable studies and labor in simplified practice, has simplified the relation of the American yard to the meter by lopping off all decimal figures but two, making the ratio

$$1 \text{ meter} = 39.37 \text{ inches}$$

whereas the British equivalent is declared to be

$$1 \text{ meter} = 39.370113 \text{ inches}$$

Now, of course, this eleven hundred-thousandths of an inch is a long way within the 12-mile limit, and I suppose we can not protest if the United States seizes upon it, but to the ordinary man it does seem a pity that this nebulous inexactitude should have developed to destroy the metrological harmony between the two great branches of the English-speaking people. It looks as if we have here a variant of Euclid's axiom—things which are equal to the same thing are not equal to one another.

Turning to more complimentary matters, it can be said, I think, without fear of contradiction, that to weights and measures men on this continent, Washington stands as a synonym for the Bureau of Standards. It might as well be admitted right now that there is nothing in Ottawa to compare with the highly developed scientific and technical institution that you have here. Nevertheless, it is nothing for Canada to be ashamed of. We are only some 60 years from confederation, and a considerably longer time elapsed between

Digitized by Google

United States independence and the establishment of your magnificent bureau.

In 1870 the Commissioner of Inland Revenue was, ex officio, the head of the Weights and Measures Service, and it was not until 1900 that an immediate and responsible head was appointed to take charge of weights and measures work in the person of a chief inspector. It fell to the writer's lot to succeed that gentleman in 1912, which bears rather eloquent testimony to the youthfulness of organized weights and measures work in Canada.

Scientific and industrial research, with its concomitant standardization, is now recognized as fundamental to industrial success. In recognition of this fact, the Canadian Government in 1916 established the Industrial Research Council, which has since become the National Research Council, and building operations are now under way in Ottawa for the erection of three-million-dollar laboratories, the initial step toward a Canadian Bureau of Standards. Under this research organization will be collected all those numerous branches of the Government service that have been carrying on research work for years, such as the metrological section of Topographical Surveys, the metallurgical and oil section of the Department of Mines, research in agriculture and forestry, and research in connection with the standards of mass, weight, length, volume, time, heat, electricity, etc. The administration of the Weights and Measures Inspection Service will, we expect, remain attached to the Department of Trade and Commerce as at present, and when any unusually difficult technical or scientific problems arise, we shall in future be able to seek the assistance of our own Canadian Bureau of Standards.

Coming to administrative matters, the Weights and Measures Inspection Service of Canada, as has already been mentioned, is a Federal service and a branch of the Department of Trade and Commerce. The whole staff is appointed by examination under the auspices of the Civil Service Commission and all are permanent civil servants.

The whole service operates under the same legislation and under the same weights and measures instructions, emanating from the director's office in Ottawa, and by the same token, they all report back to Ottawa.

The Dominion is divided up into 18 districts, each under a district head and centered upon some principal city such as Halifax and St. John in the Maritimes, Quebec, Montreal, Ottawa, Toronto, London, Winnipeg, Saskatoon, Regina, Edmonton, Calgary, Vancouver, etc.

These 18 district offices are under the direct supervision of two superintendents, one for eastern Canada and one for western Canada, who visit the districts, audit the books and records, attend to matters of complaint and personnel, and generally perform the duties of liaison officers between the department and the field force.

In all, the staff consists of only 111 inspectors, outside the departmental staff in the Department at Ottawa, which I might say here only numbers 13, including 2 stenographers, yet despite the small field staff, inspection work is quite efficient, and I think the large number of United States interests that do weights and measures

Digitized by Google

business in Canada will indorse that claim. In fact, the wish has often been expressed to the writer that the same system operated in the United States.

It might be mentioned here that a good deal of work related to weights and measures is done by other services of the Government as, for instance, the sale of bread is supervised under provincial legislation and by provincial officers. The Department of Agriculture has a considerable staff looking after the grading and sale of root vegetables, fruit, eggs, butter, canned meat, fish, jam and preserves, etc. The Department of Health, under the food and drug act, supervises adulteration of food and the sale of "package" goods, which includes the important factor of net weight and the marking of the net contents on all package food products. The Weights and Measures Service proper is chiefly concerned with the mechanical devices used in trade and commerce and with the question of short weight and measure in its general and common occurrence, outside of those commodities that are the subject of specific legislation as previously mentioned.

Short weight, I might say, was made a statutory offense in 1919 by the addition of the following section to the weights and measures act:

> Notwithstanding any of the provisions of the Criminal Code, any person who sells, delivers, or causes to be sold or delivered, anything by weight, measure, or number, short of the quantity ordered or purchased, shall be guilty of an offense and liable to a fine not exceeding twenty-five dollars for the first offense, and to a fine not exceeding one hundred dollars for every subsequent offense.

The significance of that clause is that what the lawyers call "mens rea," that is, intent, usually embodied in the word "wilful" was and is removed as a protection against conviction. The above wording covers short weight and measure arising from any cause whatsoever—whether intentional, accidental, or from carelessness. Short weight, per se, is made an offense, and as a proven fact is, alone, enough to secure conviction.

This short-weight provision is possibly as important as the whole of the rest of the act and is complementary thereto, for there is little use in spending thousands of dollars in verifying scales and measures, etc., unless something is done to see that correct weight and measure are given.

The main factors in Canadian weights and measures administration are:

1. The examination and approval of all new types and makes of weighing and measuring equipment by the Standards Branch at Ottawa, before they can be offered for sale in Canada, or stamped by an inspector. Each machine, as approved, is covered by an official circular advising the service of such approval.

2. The inspection and stamping of all appliances, either in the factory or on the premises of the importer before they can be sold or taken into use for trade.

3. The holding by the customs officials of all entries of weights and measures equipment for the approval of the nearest weights and measures inspector before they are allowed to be released and delivered to consignee.

Digitized by Google

In this way the Canadian system excludes many palpably inferior machines and equipment and such as are so made as to be liable to facilitate fraud, whilst customs cooperation keeps the country clean of unapproved and unlawful equipment, and a lot of what is spoken of in common parlance as "junk."

In addition, the Canadian system makes for uniformity and offers a fair and easy market for the manufacturer. Once approved at Ottawa, his product is acceptable anywhere in Canada and will be stamped by any inspector provided it conforms to conditions set down in the certificate of approval, copies of which are placed in the hands of every inspector.

Canadian inspection is on the fee system, inspection fees for each type of device or machine being set by Order in Council under the provisions of the act.

Inspectors have no share whatever in the money they collect and are not allowed to use any of it to pay expenses. They receive an annual salary and are given "contingent" money to pay expenses, a lump sum being voted by Parliament each year for the administration of the Weights and Measures Service.

According to the amounts collected, the revenue from fees is deposited daily, weekly, or monthly to the credit of the Receiver General and forms part of the consolidated revenue fund of Canada.

For the protection of this revenue, special weights and measures Government revenue stamps of various denominations from 5 cents to $10 are issued and charged to each officer, who is required to affix to each certificate of inspection he issues, revenue stamps for the full amount of money collected.

These certificates are in triplicate and and consecutively numbered, and every one must be accounted for to the department. One copy with the revenue stamps affixed is given to the trader and constitutes proof of legal inspection, over and above the stamp of verification which is incised by means of a steel stamp on a suitable soft metal plug or plate provided for that purpose on each machine. One copy of the official certificate is sent to the department at Ottawa and the third is retained by the officer as his record.

In addition each officer makes out and submits a complete itinerary of each month's work, with his expenses, so that from both the preceding data the department compiles statistics covering the work and efficiency of each inspector and a complete record of all inspections, month by month, and for the year.

For the year ending March 31, 1931, fees collected totalled $420,305.52 and the expenses $353,385.24, disclosing a surplus of revenue over expenses of $66,920.28, a result I believe to be unique in the field of Government weights and measures inspection the world over.

The fee system is of course debatable, although more or less universal. The popular argument is that weights and measures exists for the protection of the public which is only as true as it is a limited statement of the case. The obligation is on the trader to sell correct weight and correct measure, and it is as much to protect the honest trader and to prevent the dishonest as to protect the public, that weights and measures inspection is made necessary.

The trader's weights and measures equipment are the instruments of his trade and the meter of his profits, and if the Government

Digitized by Google

gives him inspection and standardization service and protection from unfair competition, he should pay for that service. The annual inspection fee can quite fairly be regarded as a small premium against loss of business from unfair competition and fraudulent practices.

From the administrative point of view, the fee system has many advantages. It constitutes an incentive for the inspector and undoubtedly increases efficiency and economy. Against this it may be said the monetary factor involves the danger of a man scamping proper inspection to make a good showing, but that factor carries its own corrective, for excessive returns incite suspicion and inquiry. Against scamped inspection there is also the ever-present factor of the cross check of one scale against another, of the check between shipping and receiving weights. Complaints of this nature are frequent and if investigation disclosed that an inspector had failed to inspect—well, there might be a funeral.

Our own Canadian records for the past 20 years embody some interesting speculations in this behalf. For 1910, 1920, and 1930 the records are as follows:

Year	Number of inspectors	Expenditure	Revenue	Deficit
1910	124	$110,281.62	$92,789.30	$17,492.32
1920	127	272,515.36	149,473.43	123,041.93
1930	111	353,385.24	420,305.52	[1] 66,920.28

[1] Surplus.

The years of the war greatly increased the expense of weights and measures inspection, and in 1920 the service showed a deficit of just over $123,000. That called for reorganization and adjustment of fees, which were raised 40 per cent.

The result shows that with a reduction in staff of 16 men, made possible largely through the use of the motor car, the service wiped out the large deficit of $123,000 and established a surplus of $66,000 in 10 years. What is more, whilst revenue, which represents work done, increased 173 per cent, expenses only increased 26 per cent.

Inspection, I might say, is annual, but, of course, inspections can be made as often as the department or an inspector may deem advisable where suspicion or unsatisfactory conditions are involved. Fees, however, are only payable once a year.

The money factor, or fee system, presents the situation to the whole force in concrete form. The spur to improve the situation becomes a concrete objective and each step in the direction of self-support is an achievement, a victory won. There is no desire to make a large surplus, but every man is jealous of maintaining our status of self-support, and what is more important, every increase in efficiency reduces the individual charge for inspection against the trader. A civil servant is as much a human being as any other type of employee, and as susceptible to the incentive of success and good repute.

In common with all countries, Canada in the past few years has witnessed an astonishing development both in the extent and the

Digitized by Google

variety of weights and measures work, with an ever-increasing complexity in the problems to be solved, not the least of which is the perplexing problem of the transport and handling of adequate test loads for heavy capacity weighing equipment—with reasonable economy. This problem is found in its acutest form in the grain elevator inspection work of the west, where the introduction of tank trucks has displaced the old 12,000-pound wagon scale with 20,000-pound truck scales.

The motor truck provides efficient transport, but the dirt roads impose a limit on the total load of truck and weights. The officers carry 2,000 pounds of 50-pound weights for making corner tests, and these with the truck provide a total load of from 6,000 to 7,000 pounds.

In the Calgary districts we have experimented with an all-steel short-wheel-base dolly truck, giving a mobile 1-ton corner-test load. This has proved very satisfactory and a great economy in labor and time. Unfortunately the times are not propitious just now to buy this equipment for each prairie inspector.

The next important and more widespread problem is that of the handling and sale of gasoline, oil, and grease, a comparatively new industry that has almost doubled weights and measures work. The measuring instruments used have passed from the old blind pump to the visible and now to the meter pump, the latter presenting some of the most difficult issues that weights and measures has ever had to contend with. The meter pump has given us a great deal of trouble, but there are signs and portents of a very great improvement in the design and refinement of this type of meter being introduced.

To begin with, the meter presented an entirely new problem. For the first time weights and measures was confronted with a device that was not correct through the whole range of its possible operation. The range of its accuracy was limited—to begin with, very limited indeed. A scale that was only correct within a small range of its maximum capacity and hopelessly wrong under light loads, would not be considered at all. Yet that is about the problem presented to us in the meter. By precept and age-old weights and measures principles and practice, such a device was not entitled to consideration, but we were confronted with the facts of industrial evolution and there seemed to be no sense in trying to play King Canute and forbid this advancing tide of the meter pump.

Canadian weights and measures then bowed before this meter invasion, and I might say here that nearly all our troubles in the world of weights and measures flow over from this side of the border, and we allowed meter pumps to be installed under the proviso, and without responsibility on our part, of the full and half speed test.

I imagine this episode of recent history is more or less well known. The half-speed test, which is fundamental to a certain standard of refinement in construction and constancy, proved to be a stumbling block to the first meters and most of them are now replaced by positive displacement meters of ingenious design and easily able to take care of the half-speed test and the age-old trouble of seepage.

In the matter of grease dispensers, Canada is more or less marking time. Years ago we objected to the sale of grease by the pound as representing a physical contradiction.

Digitized by Google

In the absence of calibration to measure by volume, sale by undenominational units was permitted. This dispensing of grease by measure seems to have involved quite a few difficulties—one being the interference of air and its elimination from discharge. In issues of this kind, where there are physical and manufacturing difficulties, it is the experience of the writer that, given time, troublesome questions have a way of solving themselves and that a policy of watchful waiting is preferable to arbitrary interference, if in the meantime public interests are not being gravely sacrificed. Vast volumes of grease of course are sold, but the greasing done to the individual car, for instance, bears no relation to the consumption of gasoline, or even engine oil. As nearly every firm marketing these products in Canada are either branches of American firms, or agents for American houses, it will not be long, in view of this conference's specifications requiring that grease dispensers dispense by volume, before volumetric devices are on the market—in fact one at least, if not more, is already available—and it simply means a little adjustment in the measuring element to make them throw imperial measure. Then we can inspect and regularize the whole situation.

There remains the oil bottle. Canada has established a more or less standard type of bottle and pouring spout, more or less consistent with the specifications of this conference. The bottle is 4 inches in diameter and a capacity line must indicate full capacity in the neck of small diameter, about 2 inches, and stand clear for observation and reading. These bottle measures are inspected by inspectors, but they are not stamped, owing to the difficulties connected with stamping glass measures over a vast country.

In some quarters it has been suggested, I believe, even enacted, that oil bottles shall be made to pour or decant correct measure. There is a good deal to justify such a departure from the established idea of a measure, in the interest of accurate service, because with a viscous fluid like oil there is quite an appreciable quantity that is not decanted; on the other hand we are of the opinion in Ottawa that any such alteration in the use of a measure embodies a very grave danger to the whole structure of weights and measures standards.

The question logically arises, can we have a quart measure that is not a quart in volume? Can a quart measure be a quart measure if it holds, and is marked to hold, more than a quart?

Such a vessel can be marked by way of distinction "to pour 1 quart," but we submit that such a vessel can not be stamped as a quart measure.

Such tampering with the standards of weights and measures to meet the difficulties presented by the physical properties of commodities is full of danger. Establish this precedent with the oil bottle and we shall be confronted with different sized gallons to take care of the expansion and contraction of gasoline, which to-day is quite a live issue.

Thermometric correction might legitimately be made, but that must be by agreement. The Government can certify thermometers, but it can go no further.

Digitized by Google

The correct alternative to the oil bottle and its residue would seem to be measurement by meter or force pump, wherein lies the choice between visibility and accuracy.

Another issue of some importance might be mentioned, and that is the coin operated personal weigher.

Up to the near present these machines have not been treated very seriously, but classed rather as novelties and amusement accessories. Of late years modern hygiene and medicine has made the public weight-minded, and as a consequence there have been increasing complaints about the inaccuracy of the personal weigher.

The Canadian service has always inspected personal weighers both for private use and the coin variety—the former before they are offered for sale, the latter in the same way as ordinary commercial scales.

Inquiry disclosed that a large part of the inaccuracy in the coin scales was due to out of balance condition at zero. Most of these scales are blind. There is no zero graduation and nobody can see if they are in balance or not. Resort has to be made to the use of a standard weight and, of course, barber shops, poolrooms, etc., possess no such weights and would not use them if they did.

To correct this situation the Canadian Weights and Measures Service about a year ago decided that all personal weighers should conform to the regulations and show a zero graduation on the dial, and further that the scale should be so made as to be adjustable at "0" in the same way as any other weighing machine.

Some manufacturers have expressed appreciation of this new requirement and have made their scales accordingly. Some, of course, have protested. The free zero balance necessitates a modification of the coin-locking mechanism, but this can be made and, as stated, in some cases has been made. The interest of the public who pay for their weight demands that it shall be made, as also does the validity of weights and measures inspection. A blind scale is not a good scale, and the Canadian service is not approving any more blind scales. One American manufacturer whose scale we rejected for being blind gave ear to our arguments and proceeded to redesign the coin mechanism and zero control. Having done this, he declared that he considered the Canadian model so much the better scale that he intended to adopt it for the home market.

The above represents a few of our major difficulties and activities in the past few years. Most of our troubles, of course, originate from this side of the line, for more than any other country we, in Canada, are up against the impact of United States inventive ingenuity, and it is a pleasure in closing this paper to express our appreciation of the universal willingness on the part of all United States weights and measures industries to meet Canadian requirements, which, it may be said, we endeavor to dovetail as closely as possible with American conditions without sacrificing our essentially British ideas and outlook. The director and myself would also like to take this opportunity of voicing our deep appreciation of the valued and valuable assistance we derive from the extensive technical work of the Washington Bureau of Standards and of the ever-courteous response of its personnel to such inquiries as we may make from time to time for information.

Digitized by Google

The CHAIRMAN. I am sure the members of the conference enjoyed the paper immensely and extend to Mr. McLean our heartfelt thanks for the excellent paper. I trust he will take back to Mr. Way an expression of our appreciation.

THE EXTENSION OF WEIGHTS AND MEASURES SUPERVISION

By RALPH W. SMITH, *Bureau of Standards*

Mr. President, a weights and measures official has two well-defined classes of duties which, although directed to the same general end, are yet so distinctive that they are often separately considered. The first and more fundamental of these duties is the testing for accuracy of the actual instrumentalities of weighing and measuring, and includes the approval for commercial use of apparatus which is found to be correct, and the exclusion from commercial use of all other apparatus. The second duty is supervision over the use of approved apparatus to insure that it is of proper design for the use to which it is being put and that it is being properly used, the prevention of short weight and short measure, and the inauguration of the proper legal steps to secure the punishment of those guilty of willfully delivering less or taking more than the quantity represented. It is obvious that the exercise of the second duty must follow upon the execution of the first; but with human nature what it is, it must be equally obvious that unless the second duty is faithfully performed, the discharge of the first can effect only nominal protection to the consumer and to the competitors of that small minority of merchants who, without supervision, would indulge in dishonest practices.

This summary of the duties of a weights and measures official makes this service appear to be so fundamental and so necessary that it seems that long since it would have been established everywhere. But it is a fact that weights and measures supervision does not exist at all in some of the States, and that it is not uniformly supplied in all sections of all States where it does exist to some extent. The reasons for this condition are not readily apparent. Therefore it is proposed briefly to analyze the general causes of this condition, and in so doing to pay especial attention to the effect on business and industry which it is considered naturally flows from a proper supervision of weights and measures and the consequent attitude which it is conceived business and industry may well maintain toward the establishment and the support of official inspection services.

First, then, is there any conflict of interest between business and industry on the one hand and official weights and measures supervision on the other? There appears to be no reason why the closest cooperation and harmony should not prevail between these interests. In the first place there can be no argument that accuracy is the paramount consideration in the case of all devices used commercially to determine the weight or measure of commodities bought or sold or the value of services rendered. A scale, a weight, or a measure is procured and used for the purpose of eliminating guesswork and reaching a true value. There can be no question that the very great majority of our merchants and manufacturers desire to employ correct apparatus. Anyone who has observed the very great advances made in the last few years in the manufacture of weighing

Digitized by Google

and measuring devices knows this to be a fact. Buyers are constantly demanding greater refinements and increased accuracy and are willing to pay well for apparatus having these attributes; less satisfactory apparatus is less and less in demand. One of the important functions of the weights and measures official at this stage is to protect the buyer of the apparatus since his original inspection and approval are the guaranty to the buyer of apparatus that he has, in fact, secured the thing he desires, and for which he has paid; that is, an accurate piece of apparatus which is legal for commercial use.

If initial accuracy of apparatus is so desirable, it is axiomatic that the apparatus should be kept at all times in a condition accurately to fulfill its function; otherwise the care exercised at the time of purchase is nullified. It is a fact, however, that some persons—including many who are technically trained and should be better informed—assume that a weighing or measuring instrument is inherently accurate and will remain so until it can no longer be used, or, at least, that if it be found to be correct when new, no further attention will ever be necessary. It need not be emphasized to you, whose business it is regularly to examine these devices, that nothing could be further from the facts. Weights and measures instruments are mechanical devices in the same sense as an ordinary machine; it follows that these instruments will not, in the very nature of things, continue to maintain their accuracy indefinitely without attention. Weighing and measuring apparatus will more or less frequently become innaccurate during and as a result of use. Here again the weights and measures inspector plays an important part. His periodic examinations, when resulting in approval, are insurance to the merchant that his own apparatus and also that of his competitor, is continuing to function as it should. This insurance, which is so necessary to stability of business, can in no other way be so completely secured. The official nature of the test is also of much value especially in cases of dispute. Obviously it is a corollary that when approval fails to follow an inspection—when it is found necessary to prohibit the use of improper or inaccurate equipment—such action, far from being a detriment to business and industry is manifestly a help to these interests, since continued accuracy is every whit as important to the proper conduct of business as is initial accuracy.

Thus far one fails to find anything which should be inconsistent with enthusiastic support of weights and measures supervision on the part of industry and business.

And now let us proceed to a brief survey of how the exercise of the second group of the weights and measures officer's duties affects business and industry. Having seen to it that the mechanical condition of the weighing and measuring apparatus in his jurisdiction meets the prescribed requirements, the official makes it his business to prevent the misuse of that apparatus, to protect the buyer and the seller from the delivery of less or the taking of more—within reasonable limits—than the represented amount, and to secure the punishment of the individual who will not conform to the law but who insists upon engaging in fraudulent and dishonest practices. What effect have these activities of the official upon the commercial

Digitized by Google

life of the community? The merchant is assured that a single standard is being demanded of all and that all are being required to meet that standard. Unfair, cutthroat competition, which descends to the systematic stealing of amounts small perhaps in a given instance but aggregating a tremendous total, is eliminated. Carelessness in weighing and measuring and inattention to the rights of others in the matter of quantity determination, evils only less vicious by reason of the absence of the willful intent to defraud, are effectively banished.

In the case of any controversy involving weighing or measuring there is available in the person of the weights and measures officer an impartial and skilled arbiter to protect the interests of both parties and to adjudicate the dispute. There is inspired in the entire community a feeling of security and confidence that their rights will be conserved, a feeling which is conducive to the stimulation of business in general. Finally those elements of the business life of the community which refuse to conform to the principles of fair and honest dealing find themselves, through the action of the courts, reduced to the necessity of discontinuing their illegal practices or transferring their operations to a section where less attention is paid to accurate weights and full measure.

Certainly there is nothing in that program which conflicts in any way with the best interests of those engaged in industry or commercial pursuits. On the contrary, such a program enhances the opportunities for progress. The conclusion appears inescapable that the character of service which is rendered by weights and measures officials is such that it should have the most hearty support of business and industry everywhere.

Our next consideration may well be to inquire as to the extent of the interest in the condition, with respect to accuracy, of a piece of weighing or measuring apparatus and in the delivery of full weight and measure. As has been pointed out, the owner and user of apparatus is vitally interested. But business is by no means alone in its interest that apparatus be correct and that correct amounts be delivered. It is obvious that the parties who buy over the apparatus directly are likewise interested. Nor does the interest stop here; it extends to the entire community. In the case of sales to the ultimate consumers of commodities such as foodstuffs and other necessities of life, it becomes plain that every person in the community is directly concerned; and a little reflection will show that the indirect interest of all of our citizens in transactions perhaps several times removed from the ultimate sale is no less real, because unsatisfactory conditions at any point along the line of progression from producer to consumer will almost surely be reflected at the consumers' end of the journey. Moreover, a healthy condition in industry and commerce, inspired by fair dealings and the absence of controversy, reacts to the benefit of the community as a whole.

This being the case, it seems eminently logical that the supervision of the condition and use of weighing and measuring instrumentalities, which have such a close relation to the community as a whole, should be carried on by the community as a whole through the agency of an officer of the State or local government. Notwithstanding the soundness of the general principle of "less govern-

Digitized by Google

ment in business," nevertheless there are certain fields of activity of such a public character and of such fundamental importance that they must be subjected to official control. It is to be remembered that he who sells or buys commercially occupies a quasi public status, and that his actions affect, not himself alone, but directly or indirectly a multitude of others. Surely no fair-minded person should fail to appreciate that the control of weights and measures is a proper exercise of the police power of the State and should be supplied as a function of our State and local governments in every community in the entire country.

But if there is so great a necessity for the supervision of weights and measures, how does it happen that some of our State and local governments are lagging behind in the adoption of such regulation? It would seem that the principal reason is that some of our State and local governing bodies do not fully appreciate the conditions which actually exist within their several jurisdictions, the consequent need for comprehensive and adequate weights and measures supervision, and the tremendous savings to the people which regularly follow the establishment of such supervision. Perhaps a secondary reason, applicable to a few jurisdictions, may be the unsatisfactory results which have followed an attempt to administer an ineffective or inadequate weights and measures law, either in the jurisdiction in question or in a neighboring one; there may also have been the occasional unfortunate example of the indifferent weights and measures official who has made a farce of his administration through carelessness, inefficiency, and inattention to his duties. But such incidents, unfortunate though they are, should not result in the failure to establish or carry on supervision. Better, they should be negatived by the adoption of a better law or the securing of a more competent enforcement.

It is not unfair to assume that, in a very large number of cases, failure of State or local governing bodies to act along any particular line is a consequence of lack of insistence of demand, properly voiced, for such action. It is the general experience that consumers are favorable to proper supervision of weights and measures. But sometimes the public, as a whole, are not well organized and thus lack the proper channels to make their desires clearly known. Business and industry are usually better equipped in this respect. In view of the community of interest in weights and measures supervision it is surprising that our commercial interests have not, ere this, either in conjunction with consumers' organizations or independently, demanded and secured weights and measures supervision wherever it is lacking; for modern business in the United States is not usually backward in taking all necessary steps to protect itself and advance its interests, and it surely appears that the procurement of weights and measures supervision constitutes one of these steps.

It should be remembered in this connection that those jurisdictions which have not provided for supervision are in the minority. It is well to point out also that it is not intended to suggest by what has been said heretofore that in places where proper weights and measures supervision is now in effect business interests are inimical to this supervision, or that they have not done their full share in bringing it about. Quite the contrary is the fact. As a very gen-

Digitized by Google

eral rule the business interests of the community strongly second the efforts of the official. It is questioned, only, why the business interests of the remaining communities consent to inactivity on the part of the governing authorities in the matter of making such supervision an accomplished fact. The conclusion in this relation must be that, never having experienced the benefits to be derived, they either have not given the subject the consideration it deserves, or they fear that concomitant inconveniences will offset the good which might result from the inauguration of official weights and measures control. Such conceptions are, perhaps, not surprising, especially in view of the fact that in the past the protection of the consumer may have been overemphasized, and too little stress laid upon the advantages to be derived from competent supervision, by the business interests themselves.

The consumer being already convinced of the desirability of the service, it remains to bring the facts of the case to the attention of the business interests before it can be expected that they will come to the point of making a demand for the service in question in localities where it does not now exist. In other words, consideration may well be given to the proper method of interesting this class.

If representative business men from jurisdictions not having adequate regulation were to come into this conference and observe the proceedings here, noting the manner in which all parties to each question are invited and encouraged to discuss the matter from their various standpoints, and marking how earnest are the attempts made to do no injustice to any group, any underlying distrust of weights and measures regulation should quickly disappear. This, then, is an excellent way to interest business.

Efforts have been made in the past to secure this very result and in consequence numerous representatives of industries very immediately concerned are accustomed to attend the conference each year. The lists of those in attendance disclose numerous representatives of manufacturers of weighing and measuring devices, of railroads, of the baking industry, of petroleum producers and distributors, and of other fundamental industries in which weighing and measuring play an extremely important part. But many, and perhaps the majority, of these men come from sections in which inspection services are already firmly established. Therefore, efforts should still be carried on especially to secure business representatives from those sections from which official representation can not as yet be secured, and in these efforts every member of the conference should share. Results may be slow, because our States rarely have appropriations from which the expenses of such delegates can be paid, and because, the importance of the matter not being understood, individuals rarely can be found who are content to consume their time and to spend their personal funds to attend a meeting which is not directly in line with their particular business interest.

Again, since the conference programs must of necessity be arranged in harmony with the idea of the greatest good to the greatest number in attendance, they can not be arranged specifically to interest this group, since it would always be a small minority of the whole attendance. To do so would work an injustice on the officials who attend in order to attain greater efficiency in their work, and

Digitized by Google

who, therefore, desire a program along technical lines. However, efforts to secure such attendance should be continued, and with the cooperation of the conference membership such attendance should eventually be secured; it is reasonable to anticipate that this will be followed by an initiation of activity in those jurisdictions from which such attendance is obtained.

That country-wide weights and measures laws and their enforcement is the desirable condition is unquestionable. Primarily, business interests and consumers everywhere are entitled to benefits and protection so fundamental as this. Secondarily, our national commercial and industrial fabric is so closely woven and our interstate-commerce activities so universal, that so long as any section remains which does not regulate weights and measures its influence will, to a greater or less extent, be felt throughout the country as a whole, and those jurisdictions in which everything possible is being done to secure the best conditions will as a consequence fail to achieve entire success.

The goal, then, should be the demonstration of the advantages of supervision in so unmistakable a fashion that every jurisdiction will be convinced that it can no longer afford to lag behind. Every person who attends the national conference should constitute himself a missionary to spread the message of weights and measures protection. Especially should the representatives of business concerns and of organizations of business men lend their interest and their efforts to the movement to extend this protection to every community in the United States. The degree of success which will follow will be dependent in large measure upon the sincerity and the earnestness and the persistence with which this program is supported. But with industry, commerce, the consuming public, and the weights and measures official standing shoulder to shoulder in a joint endeavor to bring about adequate supervision in every city and town of every State throughout the length and breadth of our country, ultimate success should surely crown these efforts.

The CHAIRMAN. We are to be favored at this time by an address by a Member of the new Congress, who represents a district in a State which has long been active in weights and measures supervision, particularly on the part of city and county sealers. I am happy to introduce to you Hon. Charles West, Member of Congress from the seventeenth Ohio district.

REMARKS BY HON. CHARLES WEST, MEMBER OF CONGRESS, SEVENTEENTH OHIO DISTRICT

Mr. Chairman, ladies, and gentlemen, it is a very real pleasure for me to be here this morning and to have the privilege of speaking to the members of this conference on weights and measures. I desire to express to you and to Doctor Burgess my admiration for the splendid work that you have been doing and my appreciation of the work of the Bureau of Standards in sponsoring a movement of this kind.

In speaking to you this morning on the subject of technical progress and public government it is not my purpose to come to you in any sense as an expert or an authority on this subject of weights and measures. In fact, I must admit at the very outset that my

Digitized by Google

knowledge of this subject is merely that possessed by any layman. Accordingly, it is not my purpose to attempt in any manner to deal with the technical phases or to concern myself with those specialized problems which come to you in your official capacities as weights and measures officials. I trust, however, that what I may have to say, even though it is quite general, may also be quite intelligible. * * *

When we come to a subject like yours, the subject of weights and measures, we are dealing with one of those technical subjects which must find a place in our governmental system. Our Government has come to be a great social institution for the promotion of progress in many lines. When the last session of Congress adjourned, that Congress had to its credit an expenditure of more than ten billions of dollars for the two years of its existence, and if you are reading the newspapers you will note that revenues do not cover the actual cost of running the Government—we are having a deficit. Of that stupendous sum of money—five billions of dollars per year—approximately two and one-half billions of dollars per year were appropriated to meet the expenses of running the Federal Government. If you add to it the cost of maintenance of State governments throughout the country and the cost of municipal and local governments, which is estimated at approximately nine and one-half billions of dollars each year, you arrive at the stupendous total of more than twelve billions of dollars yearly as the investment of the American people in their Government. That sum of money is about equal to the total annual production of the farms of our country; it approximates the principal of the debts owed to us by foreign countries as they now stand with the reductions that have been made. It represents one-half or more of what we suspect is the total valuation of the railroads of the country. The American people each year are investing in their instruments of government a sum of money equal to 10 or 12 per cent of our total national income, and so it is only proper that the people themselves should have a voice in the management and in the direction of the policies of that Government. We have for many years very frankly and very sincerely attempted to recognize the conception in political philosophy that our Government rests upon the consent of the governed, and whenever there is any articulate expression of public opinion through any organized agency that properly represents a group or section of our people, that expression of public opinion has its influence in the determination of the public policies of our country. But there is a demand for another influence in government, and that is the factor of expert opinion, the presence of authoritative judgment. Our Government is no longer the small institution that it was when our country was small with a group of isolated communities. We have many complicated problems that are facing the leaders of our Government, and those problems, if wise solutions are to be found, demand expert opinion. Your subject of weights and measures is such a problem.

Of course, under the Constitution, the authority could be found for the passage of Federal laws in regard to weights and measures; and you know we have on several occasions had Federal laws enacted meeting specific problems, particularly those phases of

Digitized by Google

standardization that are peculiarly and vitally significant in the field of interstate commerce. But we have allowed the State governments to exercise the main authority in the administration and enforcement of weights and measures laws and in the formulation of systems for inspection and supervision of weights and measures within their localities.

As a Member of Congress I am in thorough sympathy, Doctor Burgess, with your work here at the Bureau of Standards and with your work in the various States, and may I say very frankly and genuinely that you can count on me for thorough and enthusiastic support for any proper measure that will promote the work which you are doing.

I believe profoundly that technical skill and expert judgment should be utilized in framing laws relating to such as the subject you gentlemen are engaged in. I believe with President Hoover, who spoke to you as Secretary of Commerce, emphasizing the vital proper relationship that exists between the Federal Government and the State governments. We have made a distribution of power between the two and while the Federal Government exercises policies that are national in scope, there is left to the local governments the authority to meet problems in their local way. We should have a balanced relationship between the Federal Government on the one hand and of the State governments on the other—enough balance to prevent excessive centralization on the one hand with its attendant evils, and its eternal inefficiencies, and enough control on the other hand to prevent complete decentralization into localized jurisdictions with resultant chaos and inefficiencies. This will make for the greatest progress in administration. I feel that the sort of things that you gentlemen do here—in meeting in your National Conferences of Weights and Measures, in exchanging your views as regards the administration of these laws, in working with a Federal agency of the Government and securing a proper relationship between the Federal Government and the State governments—is a program that is sound and wise, and should be productive of the greatest achievement in the long run.

Justice Holmes has admirably referred to that relationship— as did President Hoover when he spoke to you on one occasion three or four years ago—by stating that we have in our country at the present time what you might call 48 laboratories for experiments in government. Now, I know we are all working toward uniformity in State legislation. We are working for the general acceptance of good standards in our States. But, at the same time, our States vary in their conditions, in their development, and in the problems that confront them, and we use these various State organizations or bureaus as proper laboratories for experiment in government and that is one of the fine things that we have in our Government system at the present time.

There is another thing that I should like to speak of for just a moment, and that is the complexity of the system that we have to-day and the consequent importance and seriousness of the problems that confront organized government. I was speaking a moment ago about the matter of expert opinions in government. If

Digitized by Google

there was ever a time when our country required sound judgment and wise policies in dealing with public questions, that time is now. We are no longer the country of isolated rural communities in which we had a pastoral or an agricultural economy. We are a great industrial Nation. Take this matter of communications, the tremendous development of which we have witnessed in the last century. At the close of the War of 1812 a peace treaty was signed in December, 1814, but so long did it take for word of the signing of the peace treaty to end the war to reach this country by the old-fashioned method of sending news, that it was two or three weeks after the ending of the war that we heard of the signing of the peace treaty. Ignorant of the ending of the war we went on fighting, and the biggest battle, the battle of New Orleans, was fought on the 8th of January, 1815, after the war had officially ended.

Just about a century later when the war with Spain was fought we had improved methods of communication, and when the battle of Manila Bay was fought, the news was sent by transoceanic cable, and so quickly did the news of the victory reach our country that we knew of that battle and the victory the day before the battle occurred—that was because the international date line is in the middle of the Pacific, and when it is Saturday on that side it is Friday here. But the fact remains that we got the news the day before the battle occurred.

All of you know, when you hear over the radio the tones of the original Big Ben in the Tower of London, that through the marvelous system of broadcasting to-day you in this country hear the tones of that great bell before that bell is heard by the man in the streets of London, so marvelous has been the means of communication.

A story was told me by a man who was with the Byrd party on the trip to the Antarctic. Admiral Byrd had constructed a radio broadcasting station down there and there was a receiving and sending set in the office of the New York Times in New York City; there was also a receiving and sending set in the home of the editor of the New York Times out on Long Island. One evening the editor went home and, wishing to be undisturbed, disconnected his telephone so that no message would come to his home. An important story came in to the office in the city and the city editor wanted to reach the editor in his home on Long Island, but due to the fact that the telephone receiver was off the hook he was unable to get a telephone communication through. This is what he did. He radioed a message to Admiral Byrd at the South Pole and asked him to transmit a message back to Long Island, to the editor, telling him to put the receiver back on the hook.

In the matter of transportation, as a boy, not many years ago in a little town in Ohio, down where I was born—Mr. Tinkey, one of your members here, used to live in that town—I remember when the first automobile came to that town; there was a big crowd on the street to see the appearance of the first horseless carriage. I remember that crude device came over the top of the hill and down across the public square, going at the alarming speed of 6 to 8 miles an hour, zigzagging across the street because of the crude steering arrangment of the machine; when the people saw it coming they all pushed back to the walls of the buildings on the sidewalks, for fear that something

Digitized by Google

might happen and that automobile would suddenly turn in their direction and run over them. To-day note the marvelous change in the mechanism of an automobile. A friend of mine went from Columbus, Ohio, to Chicago, a distance of 300 miles, in one of the new-type cars. He averaged more than 50 miles and at times went over 90 miles an hour, over a hard-surfaced pavement in a machine with great power, with great weight, and with great speed. Now, my point is this: In the old days when you had only a few machines, the horses understood what to do and got out of the way, and it was very seldom that you met any other machine. When a machine was going along at 8, 10, or 15 miles an hour it did not so much matter what kind of a steering wheel it had. But the automobile was perfected, the mechanism of that machine was developed to give greater power, weight, and speed, and we now have literally millions of them on the highways and the streets of our country; it is now highly important that along with the perfection of the mechanism there should be a perfection of the steering wheel.

So it is to-day. As our industrial system becomes more complicated, as our social organization extends its jurisdiction to 120,000,000 people scattered over three and one-half million square miles of territory, as our mechanism of government becomes more complex, it is highly important that the management and the direction of society should be made by skilled measures. That is the place in modern government for the opinion or the judgment of the expert. Now, there are some questions, of course, that are purely political in character and should not be selected, but there are other questions which are based and should be settled strictly and absolutely upon the basis of fact, upon skilled technical opinion; and the great challenge to our country to-day is to furnish that skilled opinion and that authoritative judgment on public questions.

If I may speak for just a moment with reference to the present industrial or business situation in our country, in my judgment the situation is one that calls for the wisdom and for the advice of experts. In my judgment it is just as inexcusable for us to find ourselves utterly unprepared in a matter of national defense when our country faces an international crisis as it is for us with our great governmental organizations to find ourselves utterly unprepared to deal with an economic crisis such as that which confronts our country at the present time.

Of course, I know that a business depression is a whole lot like a leaking roof. When it is raining you do not fix your leaking roof because you can't, and when you have good weather you do not fix it because you do not need to. Now we have been having business depressions for more than a century. We had one in 1817, another in 1837, one in 1847, one in 1857, then a bad one in 1873, again in 1884, another in 1893; a slight drop in 1900, another in 1907, the beginning of a serious one in 1914, the severity of which was mitigated by the World War; a slight one in 1921, and the present depression which confronts us. Are there things that can be done? Our experts in the field of economics know that there are certain causes of economic depression. They know, for example, that one of them is the element of variation in natural conditions, periods of excessive rainfall and drought that affect agricultural and business conditions.

Digitized by Google

They know another factor is the element of overproduction that we have at the present time in the matter of wheat and other peacetime commodities. They know that each period of prosperity brings on a depression.

During the past 10 years people have obligated themselves for the payment of installments for commodities purchased amounting to ten billions of dollars; there are improper methods of distribution; and there are other factors which they say are caused by free and open unrestricted competition; but the fact remains that we have established in our Government expert fact-finding agencies that know the facts of the business conditions in this country. There is no Government in the world that has established such great fact-finding institutions as ours has. We have bureaus like the Federal Reserve Board, the Interstate Commerce Commission, the Federal Trade Commission, the Radio Commission, the Federal Farm Loan Board, and others. It is a challenge to our country. If popular government is going to function efficiently and meet the problems of a modern complex system, we must utilize the expert judgment of our authorities in these fields and find remedies which, if they will not wholly remove business depressions, will at least mitigate some of the more serious phases.

There could be organized within the machinery of our Government as it now exists a council of outstanding economists which could work with our Secretary of Labor, our Secretary of Agriculture, our Secretary of Commerce, and our Secretary of the Treasury, which could meet each year in conference with the outstanding leaders of finance, of labor, of industry in various parts of the country, and which could face frankly these business depressions that confront us from time to time.

In my judgment the significance of the work that you are doing is that it is a pioneer work. It is the kind of thing that is bringing coordination among our various jurisdictions in government. You are bringing about an integration of various agencies of our Government that are dealing with your problems, and you secure at once plans, and policies, and the adoption of measures that will make for greater uniforminty, for wise standardization, for the promotion of industry, and for greater efficiency in the administration of our laws.

I want to thank you for the kindness of your invitation in permitting me to speak to you here to-day and for the opportunity that I have had of meeting you gentlemen from the different States of the country.

The CHAIRMAN. Thank you, Mr. West, very much, for your inspiring address.

It may be appropriate at this point for the Chair to advise you of a letter from Congressman Randolph Perkins, chairman of the House Committee on Coinage, Weights, and Measures, who addressed the conference, you will remember, last year, in which he expresses regret that his engagements prevent his attendance at any of our sessions this year. Mr. Perkins extends his best wishes for the success of our meeting.

The Chair also desires to convey to the conference a greeting and an expression of good wishes from Congressman A. H. Andresen,

Digitized by Google

of Minnesota, who wrote me and asked to be remembered to the conference. You will recall that several years ago Congressman Andresen gave us a very interesting address based upon his earlier experiences as an inspector of weights and measures in Minnesota.

NECESSITY OF A CODE OF REGULATIONS FOR COMMERCIAL WEIGHING AND MEASURING DEVICES

Mr. HOLBROOK. It seems that at this session there will not be sufficient time to present the report of the committee on specifications and tolerances on a code of regulations for commercial weighing and measuring devices, but as we have a few minutes available it might be advisable to utilize them in explaining to you briefly what this report is about and the opinion of the committee as to its necessity. We can then postpone consideration of the individual items until to-morrow.

You are all familiar with the codes of specifications and tolerances adopted by this conference. At the time of their latest publication, as Handbook of the Bureau of Standards, M85, an introduction was written in relation to judging the suitability of use of commercial weighing and measuring equipment. In that discussion the following language was used:

* * * the specifications and tolerances usually adopted here are general in their character, they are drawn broadly to cover devices of certain general types, and they do not generally attempt to define or restrict the uses to which apparatus may be put. * * *

* * * were the attempt to be made to require specific types for particular uses this object would probably best be accomplished in this country by rule and regulation promulgated by the individual offices rather than by specifications and tolerances designed for national acceptance. This is for two reasons: First, the manner of use of apparatus is, under our system of law, the prerogative of the States, and they should be left entire freedom to work out these details in the manner which seems to them best. Second, the specifications and tolerances are not only guides for the weights and measures official in the enforcement of law but they also serve the very important purpose of advising the manufacturer of weighing and measuring devices as to what apparatus will be satisfactory in many of our far-flung jurisdictions. * * * the specifications and tolerances must become primarily the sole reliance of the manufacturer in judging whether his product will be satisfactory. They should, therefore, be prepared in the form which will be of most use to the manufacturer.

It seems, then, best that they be not complicated by specifications concerning the particular uses to which specific types may be put. For, after all, the manufacturer of the apparatus is not, perhaps, primarily concerned with this—certainly in most cases he can not be held generally responsible for the use in which a device which he produces may be employed. When he produces apparatus complying with the specifications and tolerances he fulfills the only duty to which he can be held strictly to account. He will, and usually does, when practicable, go further than this; to secure customer satisfaction, he will endeavor to see to it that the purchaser secures apparatus nicely fitted to his particular needs. But since he will often not be fully advised as to the condition under which the apparatus is to be used, and since, in any event, a manufacturer will practically be obliged to sell the particular device ordered, the onus of securing a device properly fitted to the particular need must, in the final analysis, be borne by the purchaser.

One further word may be added in regard to the character of the requirements contained in the specifications and tolerances. We feel that the principal object to be attained by specifications and tolerances is to eliminate from commercial use generally unsatisfactory commercial types. The desirable concomitant is to secure in place of the discarded apparatus constantly improving types. This latter condition will be most effectively secured not by

Digitized by Google

hedging the manufacturer about with specific and restrictive specifications, but rather by allowing his initiative the fullest play. The specification and tolerances have, therefore, been designed to inform the manufacturer in general language of the fundamental considerations believed to be vital to the construction of proper apparatus, and of some forms of construction found by experience not to result in accuracy, dependability, or fair dealing in the field. Within these broad limits the manufacturer has been left the greatest latitude possible in the working out of his designs.

Now, while it was said in the above that "the specifications and tolerances usually adopted here * * * do not generally attempt to define or restrict the uses to which apparatus may be put," it was necessary in a footnote to call attention to some exceptions to the general rule—to some specifications for the selection of equipment for a certain use which had necessarily been included in our codes, such as the specification under the heading "Counter scales" and other headings, which requires that scales used in the retail sale of foodstuffs at retail shall have graduations of 1 ounce or less. Then we have specifications referring to installation, such as the specification under the heading "Liquid-measuring devices" requiring that all devices shall be installed plumb and level. Again other specifications are directions to users, such as the requirements under the heading "Scales—General specifications," to the effect that all scales shall be maintained in balance.

Your committee has been giving attention to such specifications and has finally decided to recommend that a new general policy be adopted in relation to such requirements as these.

We have, as you know, general headings covering particular classes of apparatus in use—"Linear measures," "Liquid-measuring devices," "Scales" (of various types), etc. Under those general headings there are included subordinate headings—"Definition," "Specifications," "Tolerances," etc. The committee considers that it would be wise if specifications of the character noted above now in the codes of specifications and tolerances, and specifications of this kind which may hereafter be introduced, were to be assembled under a new heading to be entitled "Regulations," and to appear under each general heading. This material, in the main, would be that of use to the user of the apparatus but which is of little use to the manufacturer of apparatus, since he has no power to dictate how the apparatus shall be installed, maintained, or used. The specific recommendation of the committee, then, is to add a new subheading under our general headings to be entitled "Regulations" and to consist primarily of instructions to the user of the apparatus as to the conditions under which the apparatus is installed, maintained, or used.

If that policy is approved by the conference, then consideration of the report of the committee will be in order. In this report are cited certain specifications which are considered to be in the class mentioned, and it is proposed to remove those from the present codes of specifications and assemble them under these headings of "Regulations." If these specifications are found proper ones to be included under "Regulations" and they are transferred as suggested, these requirements will serve as a nucleus around which may be gathered other regulations which will also be proposed or which may be adopted in the future.

Digitized by Google

If we adopt this policy, the conference will then be in the position of recommending to the various jurisdictions certain uniform regulations which might reasonably be adopted for their use.

With the consent of the chairman, if the conference will at this time settle the theory of this matter and decide whether this is a proper method of procedure, and go on record in that respect, then, if the answer is affirmative, the specific recommendations can be considered to-morrow, when, I think, there will be plenty of time to introduce the details of the report which is now in your hands.

The CHAIRMAN. Do you make a motion to that effect, Mr. Holbrook?

Mr. HOLBROOK. I will make that in the form of a motion, that a new subheading of "Regulations" be included under the general headings contained in our codes, this subheading to follow the subheading entitled "Tolerances," and hereafter to include those requirements which are in the nature of instructions to purchasers or users rather than in relation to construction requirements for commercial weighing and measuring devices.

(The motion was seconded, the question was taken, and the motion was agreed to.)

APPOINTMENT OF COMMITTEES

The CHAIRMAN. It is appropriate for the Chair at this time to announce the personnel of two committees of the conference, the committee on nominations and the committee on resolutions.

As the committee on nominations the Chair appoints Howard S. Jarrett, of West Virginia, chairman; Francis Meredith, of Massachusetts; W. T. Fossett,[1] of Illinois; B. Frank Rinn, of Allentown, Pa.; and J. H. Stephenson, of Rochester, N. Y.

As the committee on resolutions George Warner, of Wisconsin, chairman; H. A. Webster, of New Hampshire; S. C. Dinsmore, of Nevada; C. D. Baucom, of North Carolina; Glenn L. Berry, of Monmouth County, N. J.; C. B. Tolan, of Fort Wayne, Ind.; and M. C. Griffin, of Hartford County, Conn.

We might take a recess at this time and assemble this afternoon at 2 o'clock, when a number of groups will start on an inspection of the bureau.

(At this point, at 12.50 o'clock p. m., the conference took a recess until 2 o'clock p. m.)

[1] Mr. Fossett, who was unable to serve on the committee, was later replaced at his request by W. A. Carleton, also of Illinois.

Digitized by Google

FOURTH SESSION (AFTERNOON OF WEDNESDAY, JUNE 3, 1931)

TOUR OF THE LABORATORIES OF THE BUREAU OF STANDARDS

(The afternoon session of the conference consisted of a visit to the various laboratories of the Bureau of Standards, particular attention being devoted to the division of weights and measures. In order to make the trip of maximum interest and helpfulness the delegates and guests of the conference were divided into small groups, each group being in charge of a member of the staff of the bureau.)

Digitized by Google

FIFTH SESSION (MORNING OF THURSDAY, JUNE 4, 1931)

The conference reassembled at 10.10 o'clock a. m., at the Bureau of Standards, Dr. George K. Burgess, president, in the chair.

DEMONSTRATION OF SCALES EMBODYING NEW DESIGN FEATURES

The CHAIRMAN. Our program this morning carries two items which the Chair will comment upon briefly.

As many of you know, some years ago we were accustomed to have an exhibit of commercial weighing and measuring devices in connection with the national conference. As time went on both the manufacturers and the officials seemed to have less interest in the exhibits, largely, perhaps from the fact that many of the devices were already familiar to them. Accordingly, exhibits were discontinued with the understanding that they might be resumed if and when conditions seemed to justify them.

There are included upon our program this year two exhibits which, however, have been strictly limited in their scope. The first is in connection with a demonstration by manufacturers of scales embodying new design features; the apparatus used by the speakers to illustrate their remarks will be on exhibit during the remainder of the day. The other is an exhibit of person-weigher scales, which is especially appropriate in view of the consideration which is to be given to specifications and tolerances for these scales, and the probable unfamiliarity of many of you with the details of design, construction, operation and adjustment of person weighers.

These two items are something in the nature of an experiment and I will ask Mr. Holbrook to read the letter which was sent to scale manufacturers all over the country.

Mr. HOLBROOK. The letter is as follows:

GENTLEMEN: It is our thought to introduce on the program of the Twenty-fourth National Conference on Weights and Measures a new item, which may or may not be continued in future years, depending upon its treatment and reception this year.

This subject is a sort of symposium to be participated in by manufacturers of commercial weighing devices, our thought being to give to such manufacturers the opportunity of presenting briefly to the conference such of their products as have been very recently developed or placed upon the market.

The idea of this subject is to acquaint the weights and measures officials with the latest developments in the scale industry so that they may not only keep abreast of these developments as a matter of information, but may also be sufficiently instructed as to the novel features of new devices, methods of balancing, etc., and any other matters which should properly be brought to their attention, that when these devices are introduced into their jurisdictions they will understand them and be qualified to accord them appropriate treatment.

It is obvious that if this item is to be successful it must be constructive and interesting, from which it follows that manufacturers should not bring before the conference devices with which the weights and measures officials

Digitized by Google

in attendance may be presumed to be already reasonably familiar. In other words, the devices presented not only should be reasonably new as to design (probably developed and/or marketed within the past year), but also should present sufficiently novel mechanical features to make it reasonable that these be given special attention. It would appear that the decision on these points must rest with representatives of the conference. Moreover, the item will be successful only if a reasonable number of manufacturers participate in it. Until we receive the reaction of the manufacturers being addressed, we will be unable to determine definitely whether or not to include this item on our conference program this year. It is requested, therefore, that you give this matter your careful attention and let me have an expression of your opinion upon it at your very earliest convenience, indicating whether or not your company would have any scale which you consider meets the qualifications outlined above and which you would be prepared to present to the conference in the manner indicated, and, if so, giving us a brief description of the scale in question.

Should a single manufacturer desire to present more than one scale, this will be satisfactory provided that the number of manufacturers participating is not so great as to prolong this item unduly; if eliminations must be made because of shortage of time, these will first be made so as to reduce to one the devices to be presented by each manufacturer.

If this item is included on the program we believe that each of the devices in question should be exhibited to the conference at the time that the manufacturer's representative explains it and that the explanatory matter should be prepared with the idea of its being of maximum constructive value to the weights and measures official. Naturally, the presentation should in no way be a sales talk. We can not estimate as yet how much time will be required for this item if given, but it would be our thought that each manufacturer's representative would be allowed sufficient time properly to present his subject; from 10 to 20 minutes would appear to be reasonable in this connection.

In the case of person-weighing scales we are prepared to waive the limitations previously expressed relative to novel mechanical features and development or marketing within the past year. This is because it is anticipated that the conference will consider a tentative code of specifications and tolerances for person-weighing scales. Manufacturers desiring to exhibit their person weighers will probably be permitted to do so regardless of whether or not the demonstration of novel features, previously discussed, is included on the program, provided that a representative number desire so to exhibit. If you manufacture person weighers, please indicate in your reply your desires in this relation.

Please let me have your reply at your earliest convenience so that if the item in question is to be included upon the conference program, and if an exhibit of person weighers is to be made, we may proceed as early as possible with the necessary arrangements.

Respectfully,

(Signed) F. S. Holbrook,
Secretary, National Conference on Weights and Measures.

I may say in this connection that some manufacturers of scales appeared to view the inclusion of this item with great enthusiasm. Several very enthusiastic letters were received from manufacturers in which it was said that a program item enabling the manufacturers of weighing and measuring devices to exhibit their products and to familiarize weights and measures officials with them, would be a splendid one and would enure to the joint advantage of the officials and the manufacturers. However, a surprisingly small number of manufacturers expressed an actual desire to participate in the item and for some weeks after the letter was sent out it was very questionable whether the item would be included on account of the very few manufacturers who desired to avail themselves of the privilege extended. However, eventually five or six manufacturers accepted the invitation, and we thought this number justified our including the items experimentally in the program. The success

Digitized by Google

of the item this year will to a large extent dictate whether this will be continued or revived in the future.

The CHAIRMAN. As Mr. Holbrook has intimated, while the response to this invitation has been less than anticipated, it was nevertheless decided to include the item in the program. I hope we may have an expression from the conference before adjournment as to whether or not a similar item shall be scheduled for the program of the next conference.

I will call upon the representatives of the manufacturers who are to participate in the demonstration of scales embodying new design features, in the alphabetical order determined by the names of the companies.

I will ask the speakers to confine themselves to 10 minutes.

SECRETARY'S NOTE.—At this point several manufacturers brought before the conference samples of scales embodying new design features and demonstrated them to those in attendance. Particular attention was given to the new features incorporated, the method of manipulation of the adjustments provided, and the answering of questions asked by members. As was the experience in a former case,[1] it was found that many of the remarks made are of no value to a reader when a sample of the product is not before him, and thus no good purpose would be subserved in printing such material here. Consequently it has been decided only to include here a portion of the debate which followed the formal demonstrations, which under the circumstances seems to include the material of most interest and value.

It may be noted, however, that such demonstrations as these, which familiarize the delegates with new apparatus, are of great interest and value to them. Attendance at the conference is the only way in which full advantage can be obtained from program features such as this. The delegates were duly appreciative of the efforts of the manufacturers who took part in this demonstration.

DISCUSSION FOLLOWING DEMONSTRATION BY MANUFACTURERS

Mr. CROCKETT. Mr. Chairman, in the case of a scale having two pans somewhat similar to each other, one intended for the weight and the other for the commodity, and having an indicator purporting to show underweight and overweight, is there any designation to show which is the weight platter and which the load platter?

Mr. WOODLAND. The scale is built in the customary way. People are very familiar with which side is the weight platter.

Mr. CROCKETT. I do not agree with you. A man can put the weight on the wrong platter and the indicator would show the commodity overweight, when in reality it is short weight.

Mr. WOODLAND. If there is intent to defraud on the part of the operator, that intent can be applied to any scale made to-day.

Mr. CROCKETT. I grant you that, but don't you think it would be well to place an inscription on each scale indicating which side is for the weight and which side for the load?

Mr. WOODLAND. Some of the scales employ scoops; the scale is made to suit the particular commodities it generally handles.

Mr. CROCKETT. That is true; but what does the ordinary housewife know as to which is the weight and which is the load platter?

Mr. WOODLAND. I think, speaking for all manufacturers, there is nothing we can do. We could put a red light or sign on it, but we do have to agree with the custom that has been followed for so many

[1] See Demonstration of Gasoline Meters by Manufacturers in Report of the Twenty-Third National Conference on Weights and Measures (p. 104).

Digitized by Google

years. We would like to put wording on saying "this is the weight platter," but we can not do it.

Mr. CROCKETT. It could be cast in the weight platter.

Mr. WOODLAND. It could be, but we like to keep the platters smooth and clean. As you can see it would be possible to stamp the weight platter, but the wording would be covered by the weight when the weight is put on. However, we are open to suggestions.

Mr. WARNER. I would like to ask if it would not be well to have the weight platter of just sufficient size to take care of the weight?

Mr. WOODLAND. The weight pan is 5 inches in diameter, the commodity pan 7; thus there is 2 inches difference between the weight and the commodity platters in this model. The capacity of the scale is 6 pounds and it can be increased to 10 pounds; unless you stack the weights you can not get 9 pounds on this weight platter.

Mr. SWEENEY. Why not put an arrow in front showing which is the weight pan?

Mr. WOODLAND. That is a good suggestion. We could put that on the front. That would be possible and is a very good suggestion.

Mr. A. B. SMITH. Mr. Woodland, in the case of a scale which is sold to weights and measures officials for testing purposes, from the moment that scale enters the possession of an inspector it becomes a standard, therefore that scale should be submitted to Harrisburg for sealing before it goes to the inspector, the same as any standard weight.

Mr. NEALE. I want to call attention to a situation which exists. On some scales there are placed the approval marks of New York City, Massachusetts, Pennsylvania, and Alabama; each of those States requires its own mark to be placed on the scale. There are 6 States requiring scales to be approved—New York, New Jersey, Massachusetts, Pennsylvania, North Carolina, and Alabama. I do not know what will eventually be required even with the good work my good friends are doing. I hope the time will come when we can have one marking, good in every State. As I have said, in some States not only must we get approval but we must put a disk on to show that approval. That results in a number of marks on the same scale, for while you may say that the manufacturer sells a particular scale to but one State, nevertheless we must have warehouse stock and ship therefrom, and since we can not have one warehouse for every State, we must have all the marks on each scale. Somebody must pay that price, and there is no question but that it all is passed on to the consumer.

SUPPLYING COPIES OF PAPER OF RALPH W. SMITH

Mr. CROCKETT. In regard to that wonderful paper that Mr. Smith read; will that be available to the members of the conference?

Mr. SMITH. I see Doctor Burgess looking at me. Copies are not available, but, if it is the desire of the conference, that can be mimeographed and made available.

Mr. CROCKETT. I think it is the desire of the conference that we have copies.

Mr. STRONG. I want to tell you that I will go further than that. I will have his paper mimeographed, and we will send it to every

Digitized by Google

county, city, and State sealer of weights and measures in the state of Michigan, on my return.

Mr. WEBSTER. Mr. Chairman, I also want to voice the sentiment expressed. I think we in weights and measures work are extremely fortunate in having as one of the officers in this citadel of learning a man who can produce such a cogent and well-delivered address as Mr. Smith did yesterday, and I had hoped that copies of his address would become available before we concluded the conference.

The CHAIRMAN. In connection with the report of the committee on specifications and tolerances on a code of regulations, you remember we passed a motion yesterday approving this code in principle. Now, the committee, I understand, has specific recommendations to make.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON A CODE OF REGULATIONS, PRESENTED BY F. S. HOLBROOK, CHAIRMAN

Yesterday the conference went on record as approving a new subheading, to be known as "Regulations" to be established under each of the main headings specifying the various classes of apparatus dealt with by the specifications and tolerances of the conference.

Your committee now has to present a detailed report in this connection.

The first portion of this report recommends that the following specifications, now embodied in various codes of specifications of this conference, be transferred, without amendment, from their present position in the codes to this new subheading.

Class of apparatus	Old specification No.	Page of M 85	New regulation No.
Linear measures	9	24	1
Taximeters	11	35	1
Liquid-measuring devices	2 (Second sentence only)	48	1
Dry capacity measures	8	73	1
Scales—general specifications	2a	77	1
	25 (All that portion beginning with the words "all scales shall be maintained in balance")	80	2
Platform scales	4	83	1
	7a	84	2
Counter scales	10a	95	1
	12	95	2
Spring scales	4	99	1
	12	100	2
	19	101	3
Computing scales	8	105	1
	15	106	2

The remainder of the report falls in a somewhat different category since amendments are recommended and new material suggested.

Transfer specification No. 24, under the heading "Liquid-measuring devices," reading as follows:

24. HEIGHT OF SUCTION LIFT.—No defined-stroke, piston-type, liquid-measuring device shall be so installed as to work under a total suction head sufficient

Digitized by Google

to cause vaporization of the liquid for which it is used under the highest temperature and lowest barometric pressure likely to occur.

to the subheading of "Regulations" and amend to read as follows:

2. VAPOR OR AIR IN SUPPLY LINE.—Any installation of a defined-stroke, piston-type, liquid-measuring device shall be such that the total suction head will not be sufficient to cause vaporization of the liquid for which the device is used under the highest temperature and lowest barometric pressure likely to occur.

Any installation of a meter-type liquid-measuring device shall include an effective automatic air-release unit as close as practicable to the measuring element whenever there is a reasonable probability that there will be any vaporization of the liquid for which the device is used under the highest temperature and lowest barometric pressure likely to occur, or that there will be any introduction of air into the system on the inlet side of the measuring element.

Insert a regulation under the heading "Liquid-measuring devices" to be numbered 3 and to read as follows:

3. METHOD OF OPERATION.—A liquid-measuring device shall be operated in accordance with the method which is obviously indicated by its construction or which is indicated by the manufacturer through the medium of instructions contained on the device itself; if the device is operated in any other manner, then the commercial use of the said device shall be prohibited and it shall be subject to condemnation.

The above recommendations were placed in your hands in mimeographed form a day or two ago.

Respectfully submitted.

(Signed) F. S. HOLBROOK, *Chairman*,
I. L. MILLER,
JOSEPH G. ROGERS,
W. A. PAYNE,
Committee on Specifications and Tolerances.

DISCUSSION OF ABOVE REPORT

SECRETARY'S NOTE.—When this report was presented at the conference each specification given in the tabulated matter in the report and recommended for transfer, was read and the reason for the recommendation briefly outlined, by the speaker. To conserve space and since each specification transferred can be readily identified by consulting Bureau of Standards Handbook M85, this material is not included here except where the specification was not transferred in its entirety.

Mr. HOLBROOK. In the case of specification No. 2, under the heading "Liquid-measuring devices," the second sentence only is recommended to be transferred. It reads as follows:

All liquid-measuring devices shall be installed plumb and level, and their installation shall be of such strength and rigidity as to maintain this condition.

That portion is intended to be Regulation No. 1. That obviously is an installation condition.

Specification No. 2 will then read as follows:

All liquid-measuring devices shall be so designed and constructed that they will be in normal operating position when they are in level.

It will be conceded that that is the manufacturer's responsibility.

A portion of specification No. 25, under the heading "Scales—general specifications," is recommended for transfer. This portion reads as follows:

All scales shall be maintained in balance.

Digitized by Google

A scale is in balance, as the term is used herein, when it correctly gives a weight indication of zero when there is no load on the platform, plate, or other load-receiving element.

A lever scale of the nonautomatic type not having an indicator and a graduated scale or arc is in balance when the beam comes to rest at, or oscillates through approximately equal arcs above and below, the center of the trig-loop when one is provided; or a position midway between other stops when these are provided; or a horizontal position when no trig-loop or other stops are provided.

A scale of the nonautomatic type having an indicator and a graduated scale or arc is in balance when the indicator comes to rest at, or oscillates through progressively smaller arcs about, a definite and clear zero graduation.

A scale of the automatic-indicating type—that is, one having a reading face or dial—is in balance when the indicator comes to rest at a definite and clear zero graduation.

That portion of the specification which remains reads as follows:

25. All scales shall be provided with a mechanical device or other means by which the balance condition may be adjusted.

This language will naturally remain in its present position in the code of specifications inasmuch as it is a construction requirement.

It is the recommendation of the committee that the specifications which are included in the table in the report and which have just been read [1] be transferred to the new subheading "Regulations" under the appropriate main heading.

The CHAIRMAN. Do you so move?

Mr. HOLBROOK. I will make that as a motion.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. The next recommendation is in relation to specification No. 24, under the heading "Liquid-measuring devices," reading as follows:

24. HEIGHT OF SUCTION LIFT.—No defined-stroke, piston-type, liquid-measuring device shall be so installed as to work under a total suction head sufficient to cause vaporization of the liquid for which it is used under the highest temperature and lowest barometric pressure likely to occur.

It is recommended that this be transferred to the subheading of "Regulations," numbered 2, and amended to read as follows:

2. VAPOR OR AIR IN SUPPLY LINE.—Any installation of a defined-stroke, piston-type, liquid-measuring device shall be such that the total suction head will not be sufficient to cause vaporization of the liquid for which the device is used under the highest temperature and lowest barometric pressure likely to occur.

The material read so far is practically the same as the old specification. The portion which follows constitutes a new requirement:

Any installation of a meter-type liquid-measuring device shall include an effective automatic air-release unit as close as practicable to the measuring element whenever there is a reasonable probability that there will be any vaporization of the liquid for which the device is used, under the highest temperature and lowest barometric pressure likely to occur, or that there will be any introduction of air into the system on the inlet side of the measuring element.

I think the members of the conference are all more or less familiar with the various devices which may be called "air-release" devices, now being installed by various manufacturers of meter systems.

[1] See secretary's note, p. 92; also p. 91 for table.

Digitized by Google

Since the meter system in its simplest form is a closed system in which there is no vent to the outside atmosphere, it is obvious that if gasoline vapor, or air in gaseous form, is present in the gasoline in the supply line, it will still be present at the time that the gasoline passes through the meter, and short measure of the liquid delivered to the purchaser will result. This short measure is due to the fact that a meter will successfully measure the volume of the material passing through it whether that material be gas or liquid, but liquid is the only thing that can be delivered to the car, as the gas will escape into the atmosphere.

Air may be introduced in the supply line in the form of bubbles as the result of a leak in the line. It may enter the supply line dissolved in the gasoline under pressure and form into bubbles upon the decrease of pressure as the gasoline moves through the supply line toward the meter. Bubbles of gasoline vapor may form in the supply line due to the breaking down of the gasoline as the result of turbulence, suction, or other cause.

Now it is believed by your committee that many of the short-measure deliveries, and many of the inconsistent and erratic deliveries, from meter systems are caused by the presence of vapor or air in gaseous form in the gasoline being measured. If such vapor or air is present in the gasoline, that vapor or air should be removed from the gasoline before the measurement takes place. The air-release device is for that purpose, and, if effective, it properly performs that purpose.

The committee was not willing to go to the length of recommending a mandatory specification to the effect that in every metering system an air release should be incorporated. The committee believes that in each case it should first be demonstrated or indicated that short deliveries, or erratic deliveries, from a metering system are caused by the presence of air or vapor. When that demonstration has been made then the system in question should be required to have an air release unit as one of its features. That is the reason for the requirement as presented.

The CHAIRMAN. It is moved that the recommendation of the committee be adopted.

Mr. CROCKETT. When does this regulation go into effect?

Mr. HOLBROOK. The committee felt that in case of a regulation it will devolve upon the various States adopting the regulation to define its scope and its enforcement. The States should use their own judgment in that relation.

Mr. CROCKETT. Mr. Holbrook, do you think the automatic air release in its present forms is perfected to such an extent that we ought to make the manufacturers place it upon their pumps? Do you consider them as effective as they should be?

Mr. HOLBROOK. I think that there are effective automatic air releases in various forms now available.

Mr. CROCKETT. Take a metering system and test it in a laboratory, and your results are entirely different from where you test it out in the open, in use. It is subject in the latter instance to changes in the weather—cold, heat, wet and dry conditions. I have seen some automatic air releases that did not automatically release; others

Digitized by Google

which automatically released the gasoline when they got frozen up with condensation in the mixture, creating a fire hazard.

Mr. HOLBROOK. The regulation requires that there be an effective automatic air-release unit; if it is effective it must necessarily be satisfactory.

Mr. CROCKETT. But you have not taken into consideration the changes and condensation which take place and where there is a difference in temperature there is bound to be condensation both inside and out. Now what is an effective air release?

Mr. HOLBROOK. An effective air release is one that successfully releases the air or the vapor contained in the gasoline before the gasoline passes through the metering unit of the system.

Mr. CROCKETT. Then, if it is frozen up, it is not a proper effective one?

Mr. HOLBROOK. If it is inoperative, it is not effective.

Mr. CROCKETT. If we do not have it, then why go on record to have it placed upon these systems?

Mr. HOLBROOK. We do not believe it has been demonstrated that we do not have any effective air releases at present. However, the committee has not given consideration to these air releases freezing up. Is it the experience of members of the conference that this happens in practice? If so, it seems probable that it might destroy the effectiveness of the air release for the time being, but I have not encountered that condition.

Mr. CROCKETT. I have seen an air release deliver gasoline for seven minutes before it stopped. Of course, I do not say that occurs in all sections of the country. Where there is a great variation in temperature there must be condensation; you can not get away from that. When you can overcome that difficulty, I will say you will have an effective air release.

Mr. HOLBROOK. Have any other members of the conference had a similar experience?

Mr. H. N. DAVIS. I would like to ask Mr. Holbrook just what an effective device is?

Mr. HOLBROOK. I do not think the inspector should be the sole judge. Where there is an effective State department in charge in the State, it might be necessary for them to make experiments.

Mr. BAUCOM. In studying this through, it looks to me as though we could delete this particular section and enforce paragraph 3, which requires a man to install the equipment properly; if he puts it in properly there will not be any air or vapor sucked into the line. I had a few cases of trouble where installations were drawing air through leaking joints. If the specifications for installation are lived up to, it looks as though that will cover the situation. If a pump will not work without an air-relief valve, the installation man will put it on. Also we might change the first paragraph to take in all types of pumps instead of piston-type pumps only.

Mr. HOLBROOK. That statement raises several questions that I will try to comment on. In relation to amending paragraph 1 to refer to any type of pump, it is unnecessary to make this applicable in the case of a pump vented to the atmosphere, because in that case

Digitized by Google

any air or vapor is immediately passed off from the top of the liquid and solid fuel is delivered.

In relation to the necessity for an air-release valve, this necessity may often be demonstrated upon devices in the field; but it may not in all cases be desirable to allow devices to be put into use without an air release and afterwards to require an air release when they are found to be inaccurate in the field. If it has been found that general inaccuracy encountered in a system can be cleared up by an air release, then the air release, in my opinion, should certainly be required before the device goes in the field—such devices thereafter should not be put in the field without the air release being incorporated in their construction.

A third question raised, as I understand Mr. Baucom, is whether regulation No. 3, which will be considered next, is not a satisfactory substitute for No. 2. I can not concur in that conclusion. Mr. Baucon has suggested that if the device is properly installed no air can be sucked into the line. In connection with that I would suggest that the line may be completely tight, and notwithstanding this, vaporization of liquid may occur within the line itself without leak to the outside atmosphere. Under the same conditions dissolved air may become air in gaseous form. I think that covers the committee's attitude upon the points raised.

The CHAIRMAN. The question is upon the adoption of the committee's proposal.

(The question was taken, and the regulation was adopted.[1])

Mr. HOLBROOK. The next recommendation is to insert a regulation under the heading "Liquid-measuring devices" to be numbered 3, and to read as follows:

3. METHOD OF OPERATION.—A liquid-measuring device shall be operated in accordance with the method which is obviously indicated by its construction or which is indicated by the manufacturer through the medium of instructions contained on the device itself; if the device is operated in any other manner, then the commercial use of the said device shall be prohibited and it shall be subject to condemnation.

There are devices on the market at the present time which, when operated according to the obviously proper method of operation, are entirely satisfactory devices and will deliver full measure. There are unusual and improper methods of operating some of those devices by which short measure may be caused. The correction of such condition, it seems to the committee, is largely a matter of regulation. If a device is being improperly operated—operated in a manner which was never intended by the manufacturer as shown by instructions on the pump or by the obvious design of the device itself—then it seems that the official should condemn that device or should take such steps as will make it reasonably certain that the device will be properly operated in the future. That is the gist of the regulation.

The CHAIRMAN. Are there comments or remarks?

(It was moved and seconded that the regulation be adopted, the question was taken, and the motion was agreed to.)

[1] Later, by vote of the conference, it was provided that the adoption of this regulation be tentative only. (See p. 147.)

Digitized by Google

(It was moved and seconded that the report be adopted as a whole.)

Mr. STRONG. Are these tentative or are they for immediate adoption?

Mr. HOLBROOK. It was not intended that these be tentative recommendations, inasmuch as they are not manufacturing specifications.

Mr. BAUCOM. A number of men have talked to me on this section since I have been here. What is passed here automatically becomes law in North Carolina, and I have to enforce what is done here. I will have to pass the buck on to the sealers, or vice versa. I want to study this a little before it is finally adopted, and, if I am not out of order, I would like to ask the gentlemen that we postpone a vote on this until after lunch.

The CHAIRMAN. Of course, Mr. Baucom, you can move a substitute, or an amendment to the motion, or move to table it.

Mr. BAUCOM. I move as a substitute motion that we defer action until after lunch.

(The motion was seconded.)

The CHAIRMAN. The question is upon the substitute motion to defer action on this question until after lunch.

(The question was taken, and the substitute motion was lost.)

The CHAIRMAN. The question is now on the motion to accept this report as a whole.

(The question was taken, and the motion was agreed to.)

THE SUPERVISION OF POST-OFFICE SCALES

By R. S. REGAR, *Administrative Assistant to the Postmaster General, and Purchasing Agent, Post Office Department*

Mr. President and members of the National Conference on Weights and Measures, it is a real pleasure to me to attend this conference and say a few words on the subject "The Supervision of Post-Office Scales."

Scales are the most important item of supply and equipment in the entire postal service.

Because of complaints the department received concerning our scale equipment, the Postmaster General decided that a survey should be made of the scales in use at a number of representative post offices to determine exactly the condition of these scales.

During the month of October, 1930, 15 post office inspectors were ordered to Washington for instructions in the test of scales. With the kind cooperation of the Bureau of Standards and particularly Mr. F. S. Holbrook, cochief, division of weight and measures, and his assistant, Mr. Smith, these men were enabled in a very short period to proceed to different sections of the country to make the inspections which were to be the basis for further action by the department in the matter of repair and replacement of post-office scales.

This investigation, which included post offices of all classes located in all sections of the country, developed that our postal scales are not in such condition in so far as accuracy is concerned as to make the Post Office Department proud of its equipment. It was apparent

Digitized by Google

that corrective measures must be taken immediately to protect the revenues of the Government and the interests of the public.

For many years past the field force of the department, in the way of field mechanical force, has been limited to seven men or less; therefore it has been of course impracticable for much attention to be given the scale equipment of post offices. These seven men are required to cover the entire country and inspect, adjust, repair, and maintain all mechanical equipment in post offices, including canceling machines, conveyors, pick-up tables, and other mechanical equipment, in addition to scales. The result was that only a comparatively few scales could be checked for accuracy each year and properly adjusted or replaced. As a result, over a long period of years, the scales have been very much neglected, due mainly to a lack of personnel to handle this big task and due to a lack of necessary funds to provide replacements where necessary.

The conclusion was reached by the Postmaster General that the Post Office Department should have a special division to devote its entire time to the subject of post-office scales. Under date of February 19 of this year the Postmaster General signed an order establishing the division of scales.

When it is realized that the department has in use in all post offices throughout the country approximately 250,000 scales including 90,000 nine-ounce scales, 64,000 four-pound scales, 55,000 one-hundred-pound scales, and over 10,000 parcel-post automatic scales, it is easy to understand that this new division is absolutely essential and will be faced with many and varied problems which vitally affect the Post Office Department and the general public and which must be ironed out.

For the purpose of making periodic inspections and repairs to all scale equipment, it is the purpose of the Post Office Department to appoint a field personnel of 50 men, who will visit principally the large post offices throughout the country and place the scale equipment in accurate condition.

This personnel will be assigned as near as possible to territory contiguous to their home towns. They will be thoroughly schooled in all branches of theoretical and practical scale repairs. Before this mechanical force commences operations each and every man will receive a thorough course of instructions at the Bureau of Standards. Mr. Holbrook has again volunteered to teach these men many of the intricacies of the scale problems, and it is the sincere belief of the Post Office Department that after these men have been instructed by Mr. Holbrook, followed by some practical experience in the Post Office Department laboratories, it will have a corps of scale mechanicians unsurpassed by any private or governmental activity. One reason for my optimism in this respect is the fact that this mechanical force is to be comprised only of men who have served an apprenticeship of four years as a machinist, toolmaker, instrument maker, or a comparable trade and in addition thereto have had at least one year of journeyman work.

The Post Office Department realizes that this work can not be done properly in six months or a year even with this excellent corps of men at its command, because of the large field which must be covered. Therefore, a 4-year program has been adopted. In that

Digitized by Google

period of time all scales in the Postal Service will have been replaced where necessary or repaired where possible of repair; then we will enter upon a program for future maintenance, periodic inspection, adjustment, and replacement; then we will be proud of our scale equipment. It will be just as good as the Bureau of Standards and the Post Office Department can make it. We have no apologies to offer for the present condition of this equipment; we have done the best we could over a period of 25 or 50 years with what we had to work with. This condition can not be corrected in six months or a year. It will require four years, as stated, and if we can accomplish this end in that time—and we will—we will have done a good job and we will be satisfied.

Concluding, let me add that it is the purpose of the Post Office Department not only to set its house in order in the way of its present scale equipment in every way possible, with the latest types of scales, the latest improvements on existing types, and in fact any improvement in post-office scales which can be adopted for the benefit of the service, but it will cheerfully consider and gladly accept, if practicable, considering cost, expedition, and accuracy in handling the mails, any suggestions which will improve its scale equipment.

The scale equipment of the Post Office Department represents an investment of hundreds of thousands of dollars; we hold that we are negligent if we do not give it the attention and consideration it deserves.

When your conference again meets we will be able to tell you of some of the results which the Post Office Department has accomplished in its endeavor to have accurate scales in its service.

THE DEVELOPMENT OF LARGE-CAPACITY SCALES

By A. Bousfield, *Chief Engineer, E. & T. Fairbanks & Co.*

If we are to keep pace with the onward march of progress we must look toward to-morrow and not on yesterday. However, to obtain a true perspective it is necessary to review the past.

Mechanical developement has been slowly built up, usually by improving upon the heritage of the past. It is a mark of genius to be able to step beyond the conventional limitations and anticipate the requirements of the future.

Four-section railroad track scales.—Heavy-capacity scales have been developed gradually to meet the increasing demands of the railroads and the large industrials. During the last 20 years there has been a great development in track-scale construction. The older designs, wherein rigid bearings and multiple sections were the favorite models, have been almost entirely abandoned for heavier construction in favor of fewer sections and heavier sectional capacities. The series of pictures thrown upon the screen will best serve to illustrate this development. For several years prior to 1920 suspension bearings had been used in track scales and some fairly heavy constructions had been introduced, but there was a lack of uniformity and standardization, both with regard to sectional loading, length of knife-edge, and the effective length of the weighing rail, and there was quite a diversity of opinion among railroad engineers and manufacturers as to what was the best type of construction.

Digitized by Google

In 1913 the National Bureau of Standards began an investigation of railroad track scales. This investigation disclosed the fact that track-scale design theretofore had not been based upon scientific engineering principles, and the tests showed quite clearly that there was a need, both for improved design in the scale mechanism and in the foundation and method of installation. Some few years prior to the activity of the bureau in this direction, a series of tests had been made jointly by the Pennsylvania Railroad, the Baltimore & Ohio Railroad, and the Pittsburgh & Lake Erie Railroad in the Pittsburgh district, which clearly showed the necessity for heavier equipment and more refined design. The necessity for heavier bridge girders was also clearly demonstrated and these railroads started a campaign to improve their track-scale equipment.

After the Bureau of Standards had satisfied themselves that there was a great need for improvement in standardization of railroad track scales, a committee was formed consisting of representatives from the Bureau of Standards, the American Railway Engineering Association, the Railroad and Warehouse Commission of Minnesota, the National Scale Men's Association, and the Scale and Balance Manufacturers' Association. Their deliberations resulted in the promulgation of specifications by the American Railway Engineering Association and the publication of Circular No. 83 by the Bureau of Standards. These specifications virtually excluded the old-style rigid-bearing light-capacity scales, and set forth two classes of scales that would be acceptable as standards; that is, heavy-service scales 75 to 100 ton sectional capacity and light-service scales 60 or 75 tons sectional capacity. The lengths of the scales were specified as 50-foot, 56-foot, and 60-foot, effective weighing rails, and scales were limited to not more than four sections. For motion weighing, a maximum speed of 4 miles per hour was decided upon and a minimum of 3 seconds was established for the time that each car should be entirely and alone on the scale. It was definitely specified that the main levers and the end extension levers should carry a live and a dead load corresponding to 100 per cent of the sectional capacity; that the portion of middle extension levers carrying the load from the end sectional only should be 100 per cent of the sectional capacity; that the portion of the middle extension levers carrying the combined load on the end section and the inner section should be 160 per cent of the sectional capacity; and that the transverse extension lever, shelf lever, and beam should carry 300 per cent of the sectional capacity. A minimum distance of 8 inches was established for the distance between the fulcrum pivot knife-edge and the load knife-edge in main levers for heavy-service scales, and for light-service scales this fulcrum distance was specified to be not less than 6½ inches. The bearing pressure per linear inch of knife-edge was specified not to exceed 5,000 pounds for high carbon steel or 6,000 pounds for special alloy steel. A table was prepared specifying the section modulus required for the girders in the weighbridges and also for the transverse deck supports.

These specifications and the factors established therein were the result of very careful investigation of the actual loading conditions imposed on the scale and the weighbridge for representative cars, dead load, and effects of shock due to moving loads. These speci-

Digitized by Google

fications are still in force and have served to standardize 4-section track scale design and to improve weighing conditions throughout the country, both for railroad and industrial installations. The specifications call for dead rails or relieving apparatus except to meet special requirements.

The use of dead rails on a track scale necessitates some delay in stopping to throw switches, and in some instances, backing up to get on the dead rail and notwithstanding the fact that instructions are issued to track crews to keep the locomotives off the scale rails, it frequently happens that these instructions are forgotten or violated and locomotives are allowed to pass over the scales, thus imposing overloading and shock not contemplated in the design. The dead rail also requires an extra length of straight track between the switches.

Two-section railroad track scales.—With the modern trend toward fewer parts and heavier construction in scale mechanism, the 2-section track scale has been introduced. The work of preparing the specifications for these scales was done by the yards and terminals committee of the American Railway Engineering Association in collaboration with the Bureau of Standards and the Scale and Balance Manufacturers' Association. These specifications were published by the American Railway Engineering Association, Bulletin 294, volume 28, pages 557 to 611, February, 1927. They are also printed in the Bureau of Standards Circular No. 333. They have been approved by the National Scale Men's Association and the Scale and Balance Manufacturers' Association.

These specifications cover 2-section knife-edge scales for weighing cars in railroad service without the use of dead rails. The scales are divided into two capacities; that is, 200 tons per section and 150 tons per section. The specifications are definite in specifying the class that should be selected for railroad service. The 200 ton per section scales are intended for heavy railroad and industrial service and two lengths are specified; that is, 60 feet and 75 feet.

The 60-foot scales are intended for spot weighing or for the motion weighing of cars whose wheel base does not exceed 41 feet. The 75-foot scales are intended for motion weighing of cars whose wheel base does not exceed 51 feet.

The 150 ton per section scales are selected for points where the scale traffic will be relatively light and two lengths are specified; that is, 50 feet and 60 feet. These scales, however, are not recommended for motion weighing. These specifications follow closely Bureau of Standars Circular No. 83 for 4-section scales except in so far as they are modified for the 2-section design. Some slight changes were also introduced into the limiting stresses for the materials used. For example, the working stress in tension for cast iron was changed from 1,500 pounds per square inch to 2,000 pounds per square inch. The specifications also preclude the use of high-carbon steel for pivots and bearings. The load per linear inch of knife-edge of 6,000 pounds for special alloy steel established by Bureau of Standards Circular No. 83 was maintained. The design of the weighbridges was specified to conform to the American Railway Engineering Association, general specifications for steel rail-

Digitized by Google

way bridges and the theoretical loading to be considered was specified to be Coopers E–70 for the 200 ton per section scales and Coopers E–60 for the 150 ton per section scales.

Since the specifications were issued in 1927 a large number of 2-section scales of both 200 ton and 150 ton per section have been installed, both for railroads and industrials, and they appear to have met a popular demand and are giving good satisfaction to their users.

The cost of a complete installation for a 2-section light-service track scale of 150 tons per section is somewhat higher than for a 75 ton per section 4-section track scale, varying from 10 per cent to 18 per cent. The cost of installing a heavy-service 2-section track scale 200 tons per section also runs somewhat higher than the cost of installing a 100 ton per section 4-section track scale. These higher initial costs, however, are offset by saving in operation, and it is believed that the 2-section track scales without dead rails are a better investment than the 4-section scales with dead rails.

With the advent of the large mixer cars which have recently been introduced into steel mills a demand has arisen for a 2-section track scale having a capacity of 250 tons per section and two of these scales have been built and are in successful operation. These scales were designed to comply with the Bureau of Standards Circular No. 333 except in so far as the sectional loading and the design of the girders for the weighbridge were concerned. With a loading of 250 tons per section and with the bearing pressure per linear inch of knife-edge kept at 6,000 pounds, 42-inch knife-edges are required for the load pivots in the main levers. Very heavy construction is also required in the end extension levers so as to eliminate to as great an extent as possible side sway and vibration. The scales were equipped with type-registering beams graduated 800,000 pounds by 20 pounds. These are believed to be the heaviest 2-section track scales that have been built up to the present time.

The most important advantages of the 2-section knife-edge track scales over the 4-section are the minimum number of working parts which reduces the risk of errors on account of displacement. Plain, simple, and substantial design throughout insures dependable service, and it is expected that the 2-section knife-edge track scales will give the best and most reliable service that can be expected from a knife-edge type of scale. The 2-section railroad track scale is growing in popularity, particularly for heavy weighing points. The risk of errors on account of displacement of parts or pivot wearing is reduced about in proportion to the reduction in the number of parts and to the increase in weight of individual parts of the scale mechanism. The maintenance expense is less on account of the smaller number of parts and for the same reason less time is required for making tests and adjustments. The 2-section scales are better adapted to installation without dead rails as they give a more favorable distribution of load for an equal class of equipment.

Plate fulcrum railroad track scales.—All the advantages of the 2-section knife-edge scales and none of the disadvantages due to the wearing or displacement of parts are secured by the use of the plate fulcrum construction.

Digitized by Google

The use of the plate fulcrum principle in track scales has demonstrated the following outstanding features:

1. Installation and track layout simplified, no dead rail or extra switches being required.
2. Engine time and switching saved because locomotives can pass over the scale track.
3. Maintenance reduced to a minimum, the total absence of wearing parts insuring freedom from repairs.
4. Accuracy of the weighing mechanism retained indefinitely.
5. Economies effected in operation and maintenance afford maximum return on initial investment.

Such marked and distinct advantages can be obtained solely by the use of the plate fulcrum principle and the scale design and construction that has been developed in conjunction with it.

The plate fulcrum provides a means for a direct connection between the load blocks and the lever system. They are designed with ample cross sectional area to provide ample factors of safety, and, at the same time, are capable of the slight flexure necessary to produce movement of the beam. With this type of construction the load passes directly down through the thin web section of the plate and there is absolutely no chance of wear due to contact between the pivots and bearings, such as occurs in the knife-edge construction.

The plate fulcrum scale is designed for a capacity of 200 tons per section, irrespective of the length of weighing rail. Lengths ranging from 24 feet to 76 feet have been built and are in successful operation. A sectional capacity of 200 tons in a 2-section scale is sufficiently great to withstand the shocks and vibration caused by even the heaviest locomotives passing over the scale track and in all plate fulcrum constructions throughout the country dead rails are eliminated together with their attendant switches and their necessary maintenance and upkeep.

Based on 16 years of successful experience with the plate-fulcrum principle and aided by the American Railway Engineering Association specifications for 2-section track scales, the scale has recently been redesigned by rearranging the levers and weighbridge, thereby effectively simplifying both the manufacture and the installation of the scale. The resulting new design permits economies in the use of structural steel, in excavation and in concrete, making it possible to provide this scale installed at a greatly reduced price. The strength and the operating qualities of the scale, however, have not been impaired to the slightest degree. The changes affect the construction of the weighbridge, the pit, the details of the levers, the bases on which they are supported, and the arrangement of the levers. With the new construction it has been possible to reduce the depth of the pit and the amount of excavation needed. The total installation cost is only about one-third more than for a knife-edge scale of the same size and capacity.

The plate-fulcrum principle has been successfully applied to weighing cars handled by large car dumpers which of late years have been developed for use in large central power houses. The total load of a 60-foot car dumper is 750,000 pounds so that when the weight of the loaded car is added to this, a 2-section scale having a capacity of 250 tons per section is required. In order to provide adequate support for the dumper, wide gauge main levers are required

Digitized by Google

and the end extension levers are located off center so as to clear the receiving hopper. These scales have now been in service for several years and have given good satisfaction with an entire absence of maintenance cost.

Notwithstanding the fact that many types of high grade track scales are available, in a recent report published by the Bureau of Standards, Letter Circular 295, Railroad Track Scale Testing Service of the National Bureau of Standards, Fiscal Year July 1, 1929, to June 30, 1930, we find the following:

Page 21: *Evidence of incipient decline.*—That a decline in the quality of weighing performance may be anticipated seems to be indicated by a study of Table 5 which correlates data from this and previous reports on the comparative quality of performance of railroad-owned and industry-owned track scales. Columns 4 and 7 contain the critical data which indicate that industry-owned scales are not keeping pace in improvement with railroad-owned scales. The inference may readily be drawn that this may be due to a difference in the native quality of weighing machinery and maintenance methods. Those intimately acquainted with conditions will, as a matter of course, accept the inference as a fact which requires no statistics to prove, because it is such a fact, but what is less evident is the discrepancy in the rate of improvement of the two classes of scales. The underlying truths are that the rate of improvement in railroad-owned scales is hardly what it should be considering all circumstances, and that the industry-owned scales, which as stated previously are receiving the burden of weighing freight, are falling away from a standard of performance presumably set by the carriers as being necessary for their own interests. On account of the sluggish retirement of obsolete equipment the chief credit for improvement, such as it is, must be given to diligent and intelligent maintenance methods. A structure depending upon maintenance alone, however, must ultimately break down, and the chief point of the preceding argument is that with respect to modern commercial weighing practice a manifestation of that most fundamental principle is imminent.

We feel sure that all those responsible for scale operation will regret to hear that there is evidence of incipient decline in track-scale performance, and that efforts will be made to overcome it. A campaign should be started to improve conditions, for it is believed that executives generally are alive to the importance of arriving at correct weights. The report clearly indicates that this can not be done with obsolete equipment.

On page 7 of the same report it is stated that "The average value of the underweight errors will be seen to be greater than that of the overweight errors." This is a serious condition for the owners from a financial standpoint, as it indicates that losses are being incurred.

With the introduction of 65-foot cars by some of the larger railroads and the liklihood of their numbers increasing and getting into interchange service, it is apparent that longer and heavier scales will be required to accommodate the longer wheel base of the new cars, whose length will be too great to enable them to be weighed on scales specified in Bureau of Standards Circular No. 83. It is also possible that a revision of the specifications for 2-section railroad track scales, as set forth in Bureau of Standards Circular No. 333, will be required.

The various interested parties are alive to the situation and it will undoubtedly be seriously considered in the near future.

Heavy-capacity grain-hopper scales.—The weighing of large volumes of grain in terminal elevators operating under State, board of trade, or other supervising agencies, involves exacting requirements. The loads are heavy and the tolerances of necessity are small. Interstate Commerce Commission Docket 9009 appears to be the first

Digitized by Google

attempt made by a regulatory body to control the design and manufacture of heavy-capacity grain-hopper scales. Different interpretations, however, were placed upon various parts of that report. As a result, a conference was convened at which the various interested parties were represented as follows:

Weighmasters'-Scale Men's Conference.
Minnesota Track and Hopper Scale Department.
National Scale Men's Association.
Grain Dealers Grain Conference Committee.
Elevator Builders and Designers.
Scale and Balance Manufacturers' Association.
The Bureau of Standards.

The result was that part of Docket 9009 pertaining to the design and manufacture of heavy-capacity hopper scales was revised and specifications were subsequently issued by the Bureau of Standards in their Circular 199. These specifications covered in detail load distributions, unit stresses, details of construction, together with maximum allowable values of the sensibility reciprocal, tolerances for the counterpoise weights, method of test, and accuracy requirements. It was specified that scales would be considered commercially accurate when any error did not exceed one-half pound per 1,000 pounds of the load of standardized test weights used. These specifications had the effect of materially improving the construction, particularly, of heavy-capacity grain-hopper scales and large numbers of both the 2,500-bushel and 2,000-bushel capacities have been installed since the appearance of the specifications in 1925.

Throughout this article no attempt has been made to describe in detail the various types of scales that have been mentioned, as it is felt that the details of construction used by the various manufacturers are well known both to the railroads and the industrials. The pictures will serve to illustrate many of these details; also the development that has occurred during the last 20 years.

Scientific design and refined manufacturing methods have produced scales that are well adapted to meet the exacting demands of commerce and industry and it is expected that the next decade will see still further improvements and advancement in the art of weighing. Speed and accuracy are the demands of the present generation.

May I take this opportunity on behalf of the manufacturers to express our appreciation to the Bureau of Standards of the very splendid progress that they have made in testing railroad track scales throughout the country both on railroads and in the large industrial plants?

This work which has been done by the bureau is something which no one corporation or railroad of the country, or no State could have done; you have been in more or less close touch with the fine character of the work. The yearly reports which are issued are fair and impartial and they give a wonderful account of the track-scale installation throughout the country. As a manufacturer's representative I want to assure you that the manufacturers are doing everything possible to improve their product.

(In presenting this subject Mr. Bousfield exhibited a large number of lantern slides. These illustrated a wide variety of scales and

Digitized by Google

installations from very early types down to those employed at the present day and, consequently, were of great interest and importance.)

THE SEALER'S RESPONSIBILITY RELATIVE TO PERSON-WEIGHING SCALES

By WILLIAM O. WILLIAMS, *Deputy Sealer of Weights and Measures, Trumbull County, Ohio*

Mr. President, members, and guests, this is a subject that should interest every weights and measures official no matter what his jurisdiction, although one to which I had not given much special thought or attention before the receipt of my program assignment from Mr. Holbrook, and right here I would like to add my thanks to all of you present for your assistance.

A member of this conference who has had considerable experience in weights and measures matters and from whom I had requested an opinion on this subject, stated that this was one of more importance than was generally recognized at the present time; also that it was one about which comparatively little was known by either weights and measures officials or any one else, and that it was quite a new comer in the field of weights and measures supervisional work.

It has been said that for many years coin-operated person-weighing devices, better known as penny-weighing scales, were good naturedly accepted as one of the standard American jokes. The most optimistic of those filling these machines with pennies hardly expected to get their correct weight. They were looked upon as sort of an amusement device; those using them seemed to get their penny's worth from laughing at the weight inaccuracies and fortune-telling quotations dispensed, and in trying to get their pennies back.

There is a definite connection between normal weight and normal health. Health campaigns of insurance companies and life extension institutes and a new system of combating human ills by preventive rather than curative methods, has gradually taught the American Nation to become weight conscious. People have become convinced that weight is of great importance in the scheme of health conservation, and so person-weighing scales have come into wide use and the attitude of the public toward them has changed. These scales pretend to furnish for a small sum a service to the person using them, and most of them have inscriptions suggestive that the instrument is of high dependability. When people want their correct weight and fail to get it, protests are made to both sealers and the newspapers. In some instances where news reporters were sent out to investigate, a flood of publicity unfavorable to coin-operated scales resulted which has had its effect. More publicity was given to the ridiculing of the coin-operated scale last December during the conference of the Ohio sealers at Columbus, Ohio, than was given to other important deliberations.

At this annual meeting of the Ohio sealers last December, conflicting opinions were expressed by many of the Ohio officials in attendance as to the desirability of the sealer extending supervision to person-weighing scales. However, since receiving answers from Ohio sealers in reply to my request recently made for their opinions on this same matter, I find there seems to be a change of attitude.

Digitized by Google

Those opposed took the stand that person-weighing scales were the least important scales to be supervised and that the time required to make a complete and accurate test of these devices had better be devoted to other more important types of devices used in determining quantities of commodities entering into commercial transactions. They felt that their other activities were far more essential, and demanded their attention, especially when considering the handicaps confronting Ohio sealers. Lack of personnel in their departments, lack of funds for the proper functioning of these departments, and no provision for the supplying of coins for proper operation of coin-operated devices to make complete and accurate tests thereof, were cited against further extension of the duties of the sealer. Some of the Ohio officials in expressing their opinion stated that they were opposed to extending the sealer's supervision or loading him with any additional work until such time as the Ohio statutes provide proper compensation for the sealers. Those of you who may be familiar with the set-up of the Ohio law for weights and measures administration will probably not wonder at this attitude. When I make this statement it is without casting any reflection on the active head of the Ohio administration, J. C. Tinkey, deputy State sealer. Were it not for the integrity of Mr. Tinkey and his unselfish loyalty in rendering to the purchasing public of Ohio every protection possible to be extended under a somewhat obsolete administrative authority, Ohio would not be able to hold her place as she does in weights and measures administration.

One Ohio sealer was opposed to supervision of person-weighers, stating that manufacturers and distributors of these devices, while seemingly anxious for the supervision, were more concerned that their devices be adorned with the aluminum seal so that the fact they were a sealed weighing device could be used to good advantage in their sales propaganda. He added that a fee was charged throughout his district, and the ease with which the fee could be collected from some owners and operators of person-weighers would have a tendency to encourage neglect of devices whose owners would be reluctant to pay the fees for the testing of devices used in commercial transactions.

My attention was also called to the fact that weights and measures authorities in several jurisdictions had been held by their courts to have no authority for such tests. Their opinions were based on the reasoning that such an act as person weighing is not a "commodity or thing" under the weights and measures acts of those jurisdictions.

Further opposition arises in that person-weighing scales are exposed to conditions which make it difficult to maintain them in proper weighing condition even for short periods of time, due to the misuse and abuse to which they may be subjected by children and irresponsible adults. Their exposure to the weather as well as the lack of attention on the part of owners in keeping these scales in proper condition and adjustment are urged as sufficient reasons why they should not come under supervision of the sealer. The difficulty which a sealer may experience in getting in touch with those responsible for the placing of person-weighers in given locations is cited, as well as the fact that many divisions of weights and measures are

Digitized by Google

undermanned making it impossible to make regular inspections and efficient tests of the devices, or to give uniform supervision to owners of all devices alike.

Replies to my inquiry of the department heads of several States would indicate that by far the majority of State departments feel that the sealer does have a responsibility relative to person-weighing scales.

I have been informed that the statutes of Massachusetts, New Jersey, Pennsylvania, and possibly one or two other States have provisions placing person weighers under supervision of the sealer the same as scales used in regular commercial transactions. I understand that cities of other States provide by their ordinances for supervision of these scales, some charging a license fee for their operation. The city of Milwaukee requires that a placard be placed in a conspicuous place on the device, bearing the name of the owner, and a statement that owner must refund to the user any money for which no service has been received. In the State of Massachusetts, I believe, a typewritten list of location and name of each owner of person-weighing scales is kept by some of the cities.

In Ohio the general specifications for scales can and are made applicable by many sealers to the person weigher. Those in the public schools possibly receive more attention than coin-operated devices. An Ohio official has expressed the thought that numerous codes of specifications and tolerances for the various types of scales are very confusing, especially to newly appointed officials. He offered the suggestion that at this conference one general code of specifications and tolerances be made applicable to all scales, instead of giving consideration to additional codes for the individual types of weighing devices.

While possibly the testing of person-weighing devices may not be considered of as great importance as that of devices in use to weigh commodities entering into commercial transactions, nevertheless, a large amount of revenue is taken from the public. Should not the public be protected so as to get correct information, in the same degree that owners or operators of these devices may be protected in the securing of this revenue for a service apparently rendered the public?

The coin-operated device holds itself forth to render a weighing service for the public and a fee is charged, which makes the scale distinctly commercial in character. As such it should be under the supervision of the sealer. This position may be supported in the fact that the public seem to attach great importance to weight representations made by the person weigher, having become aware of the fact that the person weighing proposition has outgrown the stage where curiosity to see the wheels go round was the prompting inducement to drop in their coins.

The matter of person weighing has grown out of what may be termed "the great American fad" and to quite a large part of the population of every community is a serious business of following the doctor's orders, or of controlling diet. People using weight indications of the public scale as a criterion of their health may become alarmed if the weights secured are inaccurate and may unwisely take steps for changing their weight. This situation may

Digitized by Google

become serious in case of people of poor health who may be striving to reduce or increase their weight upon advice of their physician.

George F. Austin, jr., supervisor of the department at Detroit, Mich., expressed himself that it certainly was the duty of all weights and measures departments to have supervision over and test and inspect both for type and accuracy the person-weighing scales, adding that there was necessity for prompt action for rigid supervision of these devices for the person-weigher situation had been a thorn in the side of weights and measures departments long enough. He hoped that the conference this year would adopt tentative specifications and tolerances covering these devices, with final adoption one year hence.

As to what tolerance should be allowed in making tests on this class of scales Mr. Austin states that considering the purpose for which they are principally used and the manner in which they are found placed to serve the public (such as in various locations inside of buildings, in partly protected entrances, and in front of buildings with little or no protection from the elements) that they should be considered a class "B" scale and given slightly larger tolerance than class "A" scale. Considering that people are using them in many instances to watch their weight from a health standpoint, he did not believe a tolerance of 1 per cent should be permitted. While it may seem rather drastic to insist on a tolerance of a fifth of 1 per cent, with a manufacturer's tolerance of one-half of that amount, at the same time there must be considered the huge revenue collected from these scales, which in no small degree indicates that it is economically practical to build a better scale for this purpose and maintain a more satisfactory brand of service than the picture presents at the present time. Mr. Austin believes "that people have been taxed sufficiently by these scale-operating companies for a service which, generally speaking, has amounted to more or less of a petty pilfering racket of no value to the public."

In line with the above from Mr. Austin I would like to quote George Warner, chief inspector of weights and measures for the State of Wisconsin, who is of the opinion there is great need for a code covering such scales and goes on to say that—

> These scales do not and can not receive the attention that other classes of scales receive, therefore, such scales should be required to be constructed in such a way that they can not easily be tampered with. They also should be constructed to withstand the action of weather conditions.
>
> This class of scales being operated for hire * * * there is no reason why the devices should not be just as correct as it is possible to get them even though such regulation might tend to increase the price of the machines. Proper regulation would eliminate many of the incorrect types now in use and from an investment standpoint would increase the value and utility of the better type of machines that would be used under proper regulation. If the confidence of the public was restored in the accuracy of these machines, their use would become more general and, therefore, the owners of proper machines would receive higher remuneration for their use.

For the reasons mentioned, Mr. Warner believes that—

> Proper regulation which would include proper inspection, testing, approval, or condemning of devices, would be of great benefit to the manufacturers, to the owners of individual units, and to the general public who pay their money expecting to receive correct weight.

Digitized by Google

In a paper delivered before the Twenty-second National Conference Mr. Roberts, superintendent of the department of the District of Columbia stated, I believe, that a tolerance was permitted in the District of 1 pound for every 100 pounds. It seems to me that the purpose for which these scales are intended and the conditions under which they are used should be carefully considered when the subject of specifications and tolerances is considered. As is well known, most person-weighing scales are located in the most prominent of public places, are used by many different persons, and as a rule receive rough treatment. For these reasons should they not be required to be of the very best type of construction in order that their accuracy may be maintained?

Details of procedure in the supervision of person weighers need not be much different than that required in the consideration of devices used in commercial practice. There could be added requirement of the name and address of the owner or party responsible for its maintenance, this to appear upon a conspicuous part of the device but not to obscure weight-indicating elements from view of the user. There should also appear, preferably on the scale dial, some statement as to the accuracy of the device, such as, "Accuracy of this device guaranteed to be within 1 pound," or statement of similar import. Owners and those responsible at location of devices should be required to have on hand at all times sufficient coins or suitable slugs for use of the inspecting official to enable him to make thorough tests.

In Ohio owners and operators of gasoline-dispensing devices are required to have proper standard tested and sealed measures with which to test these devices each day and before commencing to use a new supply of liquids. For the protection of the public user of person-weighing scales would it not appear justifiable to require the owner or those held responsible at place of location of these scales to have on hand proper tested and sealed weight standards, at least one each of the smallest unit of weight of the device, also unit standard for one-fourth, one-half, three-fourths, and the full capacity of the device? They might then be required to make tests of their devices at specified intervals and keep record of such tests available for the inspector's perusal upon his demand. This may seem unreasonable to some, but if proper safeguards are to be made available to the public this requirement should be equally applicable to person-weighing devices as to weighing and measuring devices used in commercial transactions.

The inquiry and investigation that I have been able to conduct makes it appear to me that in those jurisdictions in which person weighers are never given any official attention by the weights and measures officials the general level of accuracy of these devices is much lower than in those jurisdictions where these scales are supervised and regularly and frequently examined by the weights and measures officials.

While it may be reasonably admitted that the person weigher is of secondary importance when compared with commercial scales, nevertheless it can not be denied that the coin-operated device is a commercial scale in the sense that it charges for a service and that as such it should receive official attention from the sealer of

Digitized by Google

weights and measures. Not much harm may be done a person who may use an inaccurate person-weighing scale, yet he expects to get his money's worth in knowing his correct weight. It is only through activities of weights and measures officials that the public may be assured of the accuracy of scales. While many types of person weighers now in use seem susceptible to frequent inaccuracies brought about by constant use, and possibly abuse, it does seem reasonable that these devices should be tested at intervals. Each sealer should be given full power to inspect and supervise all person-weighing devices, particularly upon receipt of complaint of irregularities.

The extent of the supervision which the sealer can exercise in a given jurisdiction will depend upon a variety of circumstances, principal among which will be the force at his command and the time which can be devoted to the person weighers. If this supervision can be exercised without a sacrifice of other essential testing activities, then it seems that it should be so exercised.

MOTION TO RECONSIDER ADOPTION OF CODE OF REGULATIONS

Mr. MARONEY. Mr. Chairman, in regard to the adoption of the report of the committee on specifications and tolerances on a code of regulations and to bring it properly before us, I move you, sir, that we reconsider our former action. I trust that the conference will give us an opportunity to discuss it.

(The motion was seconded, the question was taken, and the motion was lost.)

Mr. HOLBROOK. Mr. Chairman, does Mr. Maroney have in mind the action on air releases incorporated in meter systems?

Mr. MARONEY. Yes, sir.

Mr. HOLBROOK. May I say, then, that I have already made arrangements to call together the committee on specifications and tolerances to listen to the statement of some of the manufacturers in that regard and that it may be possible that we can issue a report from that committee representing the results of that conference.

Mr. MARONEY. The only object I had in mind, Mr. Secretary, was that on page 2 of that specification——

The CHAIRMAN. Let us not discuss that, if you please.

Mr. MARONEY. Was the——

The CHAIRMAN. I regret, Mr. Maroney, that you are out of order.

DEMONSTRATION OF PERSON WEIGHERS

SECRETARY'S NOTE.—At this point on the program several manufacturers of person weighers brought before the conference samples of their product and briefly explained them to those in attendance. They also expressed their satisfaction that the conference was about to undertake the regulation of this class of machine and offered to cooperate in the development of a proper code of specifications and tolerances for them.

As has formerly been found to be the case[1] it seems that no good purpose would be subserved in attempting to reproduce here the remarks of the speakers,

[1] See Report of Twenty-third National Conference on Weights and Measures, p. 104, in relation to demonstration of gasoline meters by manufacturers.

Digitized by Google

since without the machines at hand, their remarks can not be made especially informative. Therefore it has been deemed wise to omit this material from this report. The members of the conference were duly appreciative of the efforts made by the manufacturers exhibiting their products.

The CHAIRMAN. In view of the closeness of the lunch hour, with the consent of the conference we will postpone consideration of the report of the committee on person weighers until this afternoon.

(Thereupon, at 12.55 o'clock p. m., the conference took a recess until 2 o'clock p. m.)

Digitized by Google

SIXTH SESSION (AFTERNOON OF THURSDAY, JUNE 4, 1931)

The conference reassembled at 2.17 o'clock p. m., H. A. Webster, a member of the executive committee, in the chair.

The ACTING CHAIRMAN. I want to say, first, that the reason for my being in the chair is due to the absence of the vice presidents. I hope you will bear with me during the time that I may preside.

Mr. NEALE. Mr. Chairman, in that talk before lunch on the subject of person weighers I forgot to say something that I think could well be brought to the attention of the committee on specifications and tolerances. Mr. Smith, of Pennsylvania, requires a means whereby a weights and measures official can plug the slot that receives the coin, sealing it up so that no coins can be put in.

The ACTING CHAIRMAN. We are very glad to receive the information.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON SPECIFICATIONS, TOLERANCES, AND REGULATIONS FOR PERSON WEIGHERS, PRESENTED BY F. S. HOLBROOK, CHAIRMAN

Mr. Chairman and gentlemen, the majority of you will remember that at the Twenty-second Conference on Weights and Measures, held in 1929, the subject of person weighers appeared for the first time upon a program of this conference in a paper by George M. Roberts, who spoke from the standpoint of an official who was testing person weighers at that time. He set forth the experiences of his department in relation to person weighers and pointed out the necessity for testing them.

Last year the viewpoint of the manufacturers of these machines was given by Charles E. Dartt, president of the Columbia Scale Co. Mr. Dartt enthusiastically recommended testing of all person weighers by officials.

In his paper this morning Mr. Williams gave it as his personal opinion, and quoted the opinions of others, that these devices should be reliable and accurate.

At the twenty-third conference last year the desirability of a code of specifications and tolerances for person-weighing scales was brought up and discussed. The consensus seemed to be that such a code would be desirable, and a motion was passed instructing your committee to prepare such a code.

Your committee, then, has been instructed by the conference to frame a code of specifications and tolerances, and weights and measures officials and manufacturers of the devices have suggested that this code be such a one that a correct scale will be provided for the purpose of person weighing, and furthermore that the scale will be a rugged and reliable one.

Digitized by Google

Your committee has proceeded accordingly and several days ago placed in your hands specific recommendations for these machines.

It is the recommendation of your committee that in accordance with the usual procedure this code be adopted tentatively only. In this event the code will lie on the table for a year, and ample opportunity will be given for further consideration of the provisions and for a study of the effect which this code would have on the present product. Also opportunity will be afforded for the manufacturers of the machines to consult with officials and advance any suggestions that they may have for its modification. During the year your committee will consider any suggestions submitted and will recommend any amendments that seem necessary and desirable for the consideration of the next conference before final adoption.

Your committee strongly feels that this method of procedure is the one which produces the most satisfactory results, since it minimizes the possibility of unwise or ill-considered action.

Respectfully submitted.

(Signed) F. S. HOLBROOK, *Chairman*,
I. L. MILLER,
JOSEPH G. ROGERS,
WILLIAM A. PAYNE,
Committee on Specifications and Tolerances.

DISCUSSION OF ABOVE REPORT

Mr. HOLBROOK. It is recommended that the code be preceded by a note as follows:

Note.—The following specifications, tolerances, and regulations shall apply to person weighers in those cases in which they are used or to be used commercially—that is, when a charge is made for the weighing service—and such use shall be permitted only when the provisions of this code are complied with. Whenever noncommercial person weighers are inspected and tested by the weights and measures official, it is recommended that these be officially sealed only when they comply with these specifications and tolerances.

Mr. Chairman, I presume that comment may be had upon each one of these specifications as we progress with the reading, in case it is desired.

DEFINITIONS.—A person weigher is a scale of any type which is specifically designed for the weighing of persons. This definition is not to be construed to include scales specifically designed for the weighing of infants and children.

A "beam" person weigher is one in which weight indications are obtained by the manipulation of one or more beam poises.

An "automatic-indicating" person weigher is one in which weights are automatically indicated on a reading face of any type.

A "ticket" person weigher is one in which a representation of each individual weight is automatically made upon a ticket, card, etc., which is automatically delivered to a suitable receptacle on the outside of the scale.

SPECIFICATIONS.—1. A person weigher shall have a capacity of not less than 250 pounds.

Mr. STEINEL. I would suggest making that 300 pounds.

Mr. HOLBROOK. It is felt that if it is desired to make a 250-pound machine, it will be perfectly obvious what its limitations are; if a person weighs over 250 pounds, he will not get on that machine. It seems improbable that a machine with a capacity of less than 300 pounds will be manufactured because the owner might miss a few

Digitized by Google

pennies, and that contingency will be avoided. We feel that 250 pounds is high enough as a minimum.

Mr. NEALE. Mr. Holbrook, what would happen if you had a 250-pound machine? Would the man weighing more than that get his penny back.

Mr. HOLBROOK. He might lose his penny.

2. A person weigher shall be so designed and constructed that it has a definite and clear zero graduation and gives a definite and clear indication of its zero-balance condition at all times when ready for use. In the case of an automatic-indicating or ticket person weigher the zone throughout which the zero balance condition shall be indicated shall correspond to at least 5 pounds on each side of the zero graduation.

You will recognize that that specification requires what is commonly referred to as the "free zero"; that is, the scale is not locked in position but is free to vibrate at the zero point.

Your committee considers that if a person weigher can get out of balance and remain out of balance without any indication of the out-of-balance condition being given on the face of the scale itself, the probability of having a correct person weigher is very much reduced. It is felt that these scales should show the condition of balance to the user.

3. A person weigher shall be so designed and constructed that it is susceptible of giving weight indications at all points between zero and capacity: Provided, however, That a person weigher may have an interval between zero and some definite weight value throughout which weight values are not given, but in this case the person weigher shall be so designed and constructed that whenever the weight on the platform is such as to fall within this interval, any coin inserted will be returned to the user through automatic delivery to a suitable receptacle on the outside of the person weigher.

If a scale is not graduated on its face in the lower part of its range or if it is not designed to furnish a ticket indication for weights of less than a certain minimum, then this specification requires that when such a load as falls with this nonregistering or nonrecording range is placed upon the platform, the coin which has already been dropped in the scale shall be returned to the person attempting to obtain such a weight from the scale. It is felt that these scales contract to do business with the public and require payment in advance; if a scale does not indicate the weight of a load placed upon the platform then the contract can not be fulfilled, and the coin already deposited should not be retained.

Mr. SWEENEY. Mr. Chairman, this section says: "A person weigher shall be so designed and constructed that it is susceptible of giving weight indications at all points between zero and capacity." Would not the second part of the specification be in conflict with that?

Mr. HOLBROOK. The second part is a proviso modifying the general statement contained in the first section. The fundamental requirement is that a person weigher shall give weight indications at all points; the proviso is to the effect that under certain conditions a person weigher may be so constructed that it will not indicate weights in a certain specified range, but in such case the coin must be returned.

Mr. SWEENEY. Then, Mr. President, I think it is ambiguous as it is. To me it appears rather odd to have a part of the specification demand a certain thing and have the second portion of the section

Digitized by Google

repeal or amend the first part, and I think there should be introduced a qualifying word. I make a suggestion that it would be a good idea to insert something of that nature.

Mr. HOLBROOK. It occurs to me that the words "provided, however," serve exactly that purpose. My understanding of a proviso is that it limits or modifies the preceding sentence. I think that is true in specification and in laws.

Mr. SWEENEY. I think that the words "or except as provided hereafter," inserted before the qualification of the second part of the section would make the thing clear and avoid conflict.

Mr. HOLBROOK. Then you would substitute "or except as provided hereafter" for "provided, however"?

Mr. SWEENEY. No; I would add these words, not substitute them.

Mr. HOLBROOK. I do not see what is accomplished by that. That seems to repeat without changing the sense. If the specification is not clear I think it should be modified, but I hardly am in a position to make a suggestion because it seems perfectly clear to me and in proper form.

The ACTING CHAIRMAN. Do you call for that as a motion, Mr. Sweeney?

Mr. BAUCOM. If the gentleman desires to put it in as an amendment, I think it would be well to do it and let us vote on it. That will get it before us in proper form and we can vote on it and reject it or approve it.

(The motion to insert the words was made and seconded, the question was taken, and the amendment was lost.)

Mr. CRAWFORD. Mr. Chairman. I would like to ask Mr. Holbrook why the graduations should not start from the zero? There have been times when I have found that business houses were using the scales to weigh freight and express. They might also be used to determine the weight of commodities sold.

Mr. HOLBROOK. Let me say that on some person weighers graduations are omitted between zero and some fixed point, such as 35 or 40 pounds. I do not know why they fail to put those graduations on. The reason may be that the manufacturer considers that the errors are so great in relation to the smallness of the load weighed, that the percentage of error is too great to allow. If the manufacturer desires to omit those graduations it seems to the committee that he has a perfect right to limit the contract which he will make with the public. In other words, if a person-weigher manufacturer does not consider that his device is accurate enough in the first 5, 10, or 15 pounds to be used for a weight of that character, then it is planned by this method to allow him to limit its weighing range provided he does not charge for the attempted weighing of such loads.

Mr. MEREDITH. Mr. Chairman. I have had to do with scales involving the very situation we are discussing now wherein it is definitely stated that the weighing does not commence until a 30-pound load is reached. I think you will find that is the practice.

Mr. HOLBROOK. The next proposed specification reads:

4. The maximum value of the minimum weight graduations on any person weigher shall be 1 pound.

5. A person weigher whose weight indication is changed by an amount greater than one-half the tolerance allowed, when set in any position on a surface making an angle of 5 per cent or approximately 3° with the horizontal, shall be

Digitized by Google

equipped with a device which will indicate when the person weigher is level, and in no case shall any pendulum operating the person weigher be considered a leveling device. The person weigher shall be rebalanced at zero each time its position is altered during the test contemplated by this specification.

You will recognize that language of the latter specification as being in a number of our codes at the present time. It is of particular importance in the case of a person weigher since this machine is often set upon an inclined ramp leading into a store. They will very frequently be used upon surfaces which are not level. Such scales may normally be moved indoors overnight and set out in some slightly new position the following morning.

6. All devices for adjusting the balance condition or the level of a person weigher shall be of such construction that they are operative or accessible only by the use of some tool or device which is outside of and entirely separate from the device in question, such as a screw driver, wrench, etc., but not an adjusting pin.

You will also recognize that language as being contained in other codes.

Mr. TINKEY. Mr. Chairman, it may be a little off the subject, but I would like to suggest that those specifications apply in every case in our codes, so why repeat them under the separate headings?

Mr. HOLBROOK. Those specifications would have been assembled under the heading "General Specifications" and not repeated elsewhere were it not for the fact that these specifications are not common to all codes. In the case of some scales it is very desirable that the balancing means can be operated without the use of an outside mechanical device. That is true in the case of outdoor platform scales where such conditions as dirt collecting on the platform or a rainstorm wetting a platform require frequent rebalancing. Such scales should be susceptible of being balanced by manual rather than mechanical means. It is therefore necessary to repeat the requirement under each heading where it is applicable.

Mr. GRIFFITH. Mr. Chairman, may I ask Mr. Holbrook whether an adjusting pin, when subject to sealing, would be allowed under the terms of specification No. 6.

Mr. HOLBROOK. I do not understand the question. The reason why an adjusting pin is not ordinarily allowed is that an adjusting pin could be thrust into the hole and left there, in which case the scale would be balanced by manual and not by mechanical means.

Mr. GRIFFITH. If it was sealed in a certain position it would prevent its change except under the supervision of a weights and measures official; why would not that be acceptable?

Mr. HOLBROOK. You would not want to seal the mechanical means by which you balance because in such event each time you wanted to balance a scale it would be necessary to get the sealer, as you could not balance it without breaking the seal. Our laws and regulations require the user of a scale to keep it in balance at all times and to manipulate the balancing means whenever the scale gets out of balance. It is inconceivable that these scales could be manufactured to maintain their balance throughout their natural life.

Mr. GRIFFITH. I think that is quite true, but when a location is once designated the sealer could seal it for that location. Why prevent the sealing of the adjustment pin in such case?

Digitized by Google

Mr. HOLBROOK. I am afraid we are talking at cross-purposes because I do not get the validity of your comment. My own idea is that scales must be rebalanced from time to time and that rebalancing is required to be performed by the owner of the scale. If you mean that the balancing means should be sealed so that its position could not be changed, I think the position taken is untenable.

Mr. BARNES. Mr. Chairman, I would like to ask Mr. Holbrook if that means that the balancing device must be accessible from the outside of the scale?

Mr. HOLBROOK. No; it does not.

Mr. BARNES. Then a key unlocking the device, making the adjusting mechanism accessible, would comply with that regulation?

Mr. HOLBROOK. Yes; I think it would.

7. A person weigher which is liable to give incorrect results except when special precautions are observed shall have appropriate and explicit instructions conspicuously, clearly, and permanently marked upon it.

For instance, an instruction such as "Stand still while weighing" or something of that sort.

8. A ticket person weigher shall be so designed and constructed that throughout a period when the supply of tickets is exhausted, any coin which is inserted will be returned to the user through automatic delivery to a suitable receptacle on the outside of the person weigher, or the insertion of a coin in the coin slot will automatically be prevented.

This is the idea of fulfillment of the contract again. If the tickets are exhausted, the scale is not in a position to fulfill its contract; in this case the scale should be so constructed either that the coin can not be deposited in the first place, or, if deposited, that it will be returned.

9. A ticket person weigher shall be so designed and constructed that the printing, stamping, or transferring of the weight record on the ticket will not occur until the weighing mechanism has had ample opportunity to come to rest, under normal person-weighing conditions.

In other words, if the type wheel was vibrating while the weight was being stamped obviously the weight stamped would in the majority of cases be incorrect, either too high or too low, according to the figure which happened to be under the stamping device at the time it operated.

Mr. CRAWFORD. Mr. Chairman, when I came to this meeting I had the idea that the ticket weigher would not be given any consideration. I have not seen such machines operated, as we have none in our territory.

The ACTING CHAIRMAN. There are scales of that type in many sections of the country.

Mr. HOLBROOK. Proposed specification No. 10 reads as follows:

10. A ticket person weigher shall be so designed and constructed that it is susceptible of giving a clear, distinct, and definite statement or representation of weight on the weight ticket.

This specification shall be construed to require that the specifications contained in this code and the specifications for automatic-indicating scales, relative to weight indicators, weight graduations, clear intervals between weight graduations, etc., shall apply to the representations of weight made by a ticket person weigher, when this representation is such as to make these requirements applicable. These requirements shall be broadly applied to appropriate portions of the said representations so as to require the same degree of clearness, definiteness, precision of reading, etc., in the case of both ticket and automatic-indicating person weighers.

Digitized by Google

If there are no manufacturers of person weighers here to explain the ticket weigher I will try briefly to explain its operation. A person drops a coin and a type wheel turns so that it is in proper position to record the weight on the platform; a blank ticket has been placed in the proper position to receive an impression representing this weight. Now a hammer falls or some other stamping device operates through the medium of an inked ribbon or other inking device to impress the representation of the weight on the ticket, which is then dropped through a slot into a receptacle outside the scale. The person weighed carries away with him this statement or representation of his weight. This specification requires that a weight so stamped must be just as clear and distinct and accurate as a weight obtained on an automatic-indicating scale of the conventional type.

Now, very frequently the representation of weight as shown by the ticket will consist of an inked replica of a portion of graduated weight scale with an arrow pointing out the weight in question. The requirement that I have just read provides that the graduated scale and the arrow stamped on the weight ticket shall comply with the same requirements as the dial and indicator of an automatic-indicating scale, so that on the ticket you will get just as good a representation of your weight as you would get from the dial of an ordinary automatic-indicating scale. In order to shorten the code, instead of repeating all those requirements they are simply referred to and you are sent back to the code of automatic-indicating scales in order to obtain the details.

11. When not modified by the requirements of this code the specifications given under the heading "Scales—General specifications," "Platform scales," and "Automatic-indicating scales" shall apply to person weighers in so far as they are applicable.

SENSIBILITY RECIPROCAL (SR).—The maximum SR allowable on beam person weighers shall be the value of two of the maximum graduations on the beam, at the capacity or at any lesser load: Provided, however, That the manufacturers' maximum SR or the maximum SR on all new beam person weighers shall be the value of one of the minimum graduations on the beam, at the capacity or at any lesser load.

That is identical with the requirement for platform scales, contained in our present code, and requires the same sensitiveness in the case of commercial beam scales and commercial beam person weighers.

TOLERANCES.—The tolerances to be allowed in excess or deficiency on beam person weighers shall be those specified under the heading "Platform scales." The tolerances to be allowed in excess or deficiency on automatic-indicating and ticket person weighers shall be those specified under the heading "Large-capacity automatic-indicating scales."

Again, in the tolerances no differentiation is made between commercial scales for general commercial purposes and coin-operated person weighers.

REGULATIONS.—1. A person weigher shall be maintained in level.

2. A ticket person weigher shall be so maintained in use that all statements or representations of weight printed, stamped, or otherwise transferred on or to the weight ticket during operation shall be clear and distinct.

You will recognize that in the specifications there is included a requirement to the effect that the scale as manufactured shall be

Digitized by Google

susceptible of giving clear and distinct impressions. This is a similar statement concerning the maintenance. As has been suggested the ticket is stamped by such means as an inked ribbon or an inking pad. This specification would require the replacing of the ribbon or the reinking of the pad occasionally so that the proper, clear indication of weight may be had.

3. A person weigher shall be permanently and legibly marked with a statement containing the name and address of the person, firm, or corporation responsible for placing the person weigher in service, in combination with some such words as "Operated by," "Maintained by," etc.: Provided, however, That such statement shall not be required when the person weigher is in service on the premises of such person, firm, or corporation.

Weights and measures officials in testing person weighers have often found that the greatest difficulty was experienced in finding out who was responsible for the person weigher in use. The person weigher may be placed in use without a statement as to its ownership and, while the receipts are doubtless regularly collected, this is done "by some person or persons unknown" as the coroner's jury has it. Unless the weights and measures official is able to communicate with the owner of the person weigher, difficulties are encountered in the enforcement of the specifications and tolerances. Therefore it is proposed that a statement be required upon the person weigher, showing who is responsible for it. If this is done, when the weights and measures official finds one that needs readjustment, or repair, or retirement from service, he can get in touch with the proper party and see that his instructions and recommendations are complied with.

Mr. NEALE. Mr. Chairman, in case a manufacturer of such a scale loans one or places it in use for 10 days with a prospective buyer to see how it pans out in a given location, how would you mark it?

Mr. HOLBROOK. Oh, I would have a cardboard sign printed and attached in some prominent place on the weigher, giving either the name of the scale company or of the person contemplating buying it, so that the sealer would know with whom to communicate in the event that he encounters it.

Mr. AUSTIN. Mr. Chairman, in respect to the question put by Mr. Barnes to Mr. Holbrook as to the accessibility of the balancing means, the locking of the scale was proposed. In my opinion it would be necessary that the sealer have access to that, and that would not be very handy if it were to be locked.

Mr. HOLBROOK. The difficulty lies in the fact that if the balancing means is accessible from the outside of the case, the malicious small boy who is so often criticised in connection with person weighers, and the public in general, will have access to the adjustments, and the scale will never be in balance.

Mr. AUSTIN. What I had in mind was an outside mechanical means for adjusting them. Some scales are so equipped.

Mr. HOLBROOK. That would doubtless not be objectionable. Whether it should be a mandatory requirement, I question. If a sealer finds a scale out of balance and can not balance it, he can but condemn it. As a matter of fact I think ordinarily the weights and measures official is accompanied by the owner of the scale or is furnished with a duplicate key, because sometimes it is necessary

Digitized by Google

for him to have access to the mechanism. Certainly I do not apprehend that the sealers of weights and measures are going to drop 10 to 20 pennies in the device to obtain the privilege of testing it. In other words, there must be some way by which they can test the device without depositing pennies.

Mr. AUSTIN. I should think it would be well to have something in here covering that point.

Mr. HOLBROOK. I take it that is a point that will be worked out by the weights and measures official in his own territory.

Mr. STEINEL. I dare say we are always provided with slugs from vending-machine companies, and we use those slugs. I think it is very necessary to have some person held responsible, for a dozen people may put in their money, and when they attempt to get it returned they are sent around from one person to another. That third rule would not entirely fix responsibility. Some person must be responsible, otherwise the effectiveness of the rule is nullified. One person should be put in charge.

The ACTING CHAIRMAN. Do you care to suggest an amendment?

Mr. STEINEL. I would move that the last part of that section reading "Provided, however, * * * firm, or corporation" be stricken out.

Mr. HOLBROOK. It seems to us unnecessary, when a scale is on the premises of the owner. In such case the weights and measures official is able to put his finger on the owner right away.

Mr. STEINEL. By the terms of our ordinance the owner's name is required to be on the scale, but it never worked out before; even the inspectors were sent from one person to another. In a railway station there are hundreds of employees, and you would not know where to go.

(The amendment was seconded.)

Mr. GRIFFITH. Mr. Chairman, it seems that the section as proposed to be amended certainly would not imply any hardship. We are going to require the name of the person, firm, or corporation responsible for placing the person weigher in service; it would be a very trifling matter to have it included in all instances. As we know, in very few cases are these owned by the owner of the premises on which they are found. It would relieve the work of weights and measures inspectors to know with whom they are dealing. I particularly refer to the use of these scales in chain stores where they are under the supervision of a clerk, or manager, or a superintendent who is not responsible except to his direct head.

Mr. WARNER. Mr. Chairman, may I make a statement? I think a great many cities throughout the country have ordinances now requiring the name of the operator of the device upon the scale. If we were to adopt the recommendation of the committee as it is, it would work a hardship on those cities, and, as Mr. Griffith stated, it is a very trifling requirement.

(The question was taken, and the motion was lost.)

(A motion was made and seconded that the specifications, tolerances, and regulations as read be adopted, the question was taken, and the motion was agreed to.)

Digitized by Google

ANNOUNCEMENT CONCERNING THE SEVENTH SESSION

Mr. HOLBROOK. Mr. Chairman, I would like to make a short statement at the present time.

On Friday morning ordinarily our sessions have been poorly attended in comparison with sessions on the other days. It may become necessary to decide whether this should be a 3-day or 4-day conference. Obviously either one would satify the Bureau of Standards. If this is going to be continued as a 4-day conference, then it is felt that we should have a good attendance upon the last day. This year, in order to stimulate attendance, we have made the last day's session of very considerable interest and importance, to induce the members of the conference to stay over for that session. One item on the program for tomorrow is Dr. W. S. Frisbie, principal chemist, Food and Drug Administration, United States Department of Agriculture, who will address you upon an important amendment which has been made in the food and drugs act. His remarks will be of the very greatest interest to all the weights and measures officials here assembled and since you have come to Washington for this meeting, I would suggest that you can not afford to miss that particular paper, Net-Content Marking of Packages under Federal Food and Drugs Act.

Other papers of interest and importance are on the program, and there will also be an important report on specifications and tolerances for odometers and on miscellaneous items relative to other codes.

The session will also, on account of an action taken to-day, become more important than it otherwise would be, since the committee on specifications and tolerances is to hold a meeting late this afternoon and may be enabled to bring in a supplementary report on the specification in relation to air-release devices on metering systems, adopted this morning. I can not tell you what the action of the committee will be, because it is, of course, not as yet determined, but there seems to be a feeling that something has been adopted which is not exactly right, and if that proves to be the case everyone will desire to correct it.

Moreover, at the meeting to-morrow morning there will be proposals at hand from several of the hotels in the city and it is probable that the headquarters hotel for next year will be selected. Those of you who are very pleased with the present headquarters will have an opportunity again to vote for the same hotel. Those of you who liked the former headquarters better or who prefer some new proposal will be able to record their preference. As you know there will be held next year the Washington bicentennial celebration, which will result in a great many visitors coming to Washington. Therefore, it will be very advisable for us to select our date now for next year's meeting, so that we can arrange to be properly provided for during the week selected.

Therefore, I want to make a special plea to anyone who is intending to leave to-night to cancel those arrangements and decide to stay over for our session to-morrow morning. If at any time the members of this conference feel that a 3-day conference is long enough and so express themselves, we will hereafter be very pleased indeed to limit the sessions to three days. That question might also be threshed out at to-morrow's meeting.

Digitized by Google

The ACTING CHAIRMAN. Before taking up the next number on the program, I wish to announce that copies of Mr. Smith's paper, which met with such hearty approval, are available and can be obtained at the desk at the conclusion of the meeting.

WHEEL WEIGHERS ON HIGHWAYS

By L. P. STRONG, *Chief, Division of Weights and Measures, State of Michigan*

For the past several years the State of Michigan has realized the necessity of a more satisfactory method of determining wheel-load weights of trucks traveling on the State highways. After careful consideration it turned its attention to permanent installations of platform scales, set on separate runways along the highways.

It is obvious that weighing the complete truck, or even one axle of a truck and dividing the weight by the number of wheels, would not give correct results. Wheel loads on a truck, or even on a single axle of a truck, will vary in their weights, according to the manner in which the truck is loaded. To meet the requirements of the State laws, it was found necessary to obtain equipment that would weigh each wheel. Variation in axle spacing of trucks limits the possibility of weighing more than two wheels or one axle at a time. It was therefore decided to use two platform scales, set side by side, at right angles to the line of travel, of such size as would accommodate the widest spread of wheels, and to place these scales close enough together to accommodate narrow gauge trucks or trucks with multiple wheels on one axle. The size of each platform ultimately decided upon was 6 feet 6 inches by 6 feet 6 inches, set so there would be but 10 inches between the two scales giving a weighing spread of 13 feet 10 inches, across the pavement. This is 1 foot 10 inches wider than the allowable width of vehicle traveling on the highways. Each scale carries a type-recording beam of 30-ton capacity, by 10-pound graduations. Both of these beams are set on a single short iron pillar and steel shelf outfit for office fixtures.

General specifications call for a scale of two sections designed for load of 15-ton capacity per quarter or 30-ton per section; require that it shall be framed with structural steel, and carry 6½ by 6½ feet by 6 inches reinforced concrete platform curbed with 6-inch channels; the pit shall have bridged sides and ends.

Since trucks will be traveling in opposite directions it was necessary to design a special poise so that a ticket could be printed on either beam, for either right or left wheel, to accommodate the direction in which the truck was traveling. As there would be a possibility of 7 axles for any truck and trailer outfit which might be using the Michigan highways, spaces for the weights of seven axles, numbered from 1 to 7, are provided on the ticket. (It is generally understood that No. 1 axle is the front of the truck, and the positions number back consecutively through the truck or train of vehicles.) To provide space for these figures and to permit other data to be incorporated in the ticket, a ticket approximately 15 inches long and 3 inches wide was found necessary and the poise had to be constructed so that a ticket of this size could be handled. This was accom-

Digitized by Google

plished by making the ticket slot continuous through the poise, and a gauge arranged to indicate the position of the ticket for the axle being weighed.

As this was the first attempt to determine wheel-load weights in this manner and as no previous data on the results of such a theory were available, every precaution was taken to obtain satisfactory results. There were several possibilities—of which three were outstanding—that might eliminate the use of such a design for obtaining accurate weights and repeated accuracy.

The possibility of transferring loads from one axle to another by the forward or backward movement of the truck was minimized by constructing the concrete approaches level for a distance of 60 feet on either side of the scale. These approaches were formed without a crown at the longitudinal center. The distance of 60 feet was determined upon as this is the length limit set for vehicles traveling on the highways.

The possibility of a longitudinal thrust from the wheels not on the scales to cause the scale mechanism to bind and not return to normal position, especially when the brakes were applied on the wheels on or off the platforms, was largely overcome by the flexibility of the suspension bearing used in the design of the scale, the weights of the weighing system and platforms combined, and the balancing and coordination of these parts.

The possibility of tipping the small platforms when heavy loads were run over them was overcome by bridging both ends and sides of each scale so that the edges of the platform would not overhang the load bearings and would lie within the rectangle formed by lines connecting the centers of these bearings.

With these obstacles apparently overcome in theory, the State installed a single unit in June, 1930. After the completion of the installation a very rigid test was conducted. Approximately 30 days after the first test was conducted another test was made, applying moving loads and giving rough usage, to determine whether the scales would repeat their accuracy. These tests showed very satisfactory results. The State then determined to adopt this method, and has made further installations, all of which have proved equally satisfactory. At the present time there are five such weigh stations located at strategic points throughout the State of Michigan, and other installations are contemplated in the near future.

(During the presentation of this paper Mr. Strong illustrated by means of lantern slides the installation described.)

The Acting Chairman. The next number on the program is a paper entitled, "Gages and Gaging." There is a field of industrial and precision measurement with which the weights and measures official has ordinarily little to do, but with which he should be familiar; I refer to the use of gages of various types. Moreover, the testing of gages, and research relative to gage design and construction, are functions of the gage section of the Bureau of Standards, and the presentation of information in this relation is in line with the policy of including on the conference program each year a paper having to do with the work of one of the sections of the weights and measures division of the bureau.

Digitized by Google

GAGES AND GAGING

By I. H. FULLMER, *Bureau of Standards*

In common usage the term "gage," as relating to devices for determining dimensions, is made to cover all kinds of dimensional standards and measuring devices. However, in connection with the interchangeable manufacture of machine parts, "gage" has a restricted technical meaning. This word is an example of some deficiencies in terminology, somewhat numerous in our language, by which one word is required to have several meanings.

Moreover, the art of gaging has advanced a long way since the professional "gauger" flourished in this broad land, upon whose determination of the capacity of casks, in gallons, as derived from caliper measurements and use of measuring rods, the profits of certain merchants as well as Government revenues depended.

In the technical sense a gage is a standard of comparison, or even more particularly the term designates standards or measuring devices which permit the correlation of dimensions without yielding numerical values. For example, a gage may be a model of the part to be manufactured, or it may be the counterpart of such a model, against which the parts may be matched as they are made. As an instance, in a certain factory an automobile body was used as a gage for testing the fit of rear fenders. If all fenders made fitted this particular body, and provided that the bodies as they were made were sufficiently alike, then fenders and bodies would go together. In such an operation a knowledge of the dimensions of the gage is unnecessary if it is the only one in use for the purpose, and provided that it does not wear out before the necessity for its use is at an end.

You will recognize at once, however, that duplicates of a gage will ordinarily be necessary, both for replacements and for simultaneous use in the same or other factories, and reproduction of gages is immensely facilitated by accurate knowledge of their dimensions. In practice the reproduction of gages on a large scale is accomplished by making them to specified dimensions within very small tolerances. Hundreds of thousands of gages are in daily use in the manufacture of such mechanisms as automobiles, bolts and nuts, balls and bearings, cutting tools, engines, gears, machinery of many kinds, machine tools, munitions and rifles, oil-field equipment, railroad equipment, typewriters, watches, etc. Accordingly the development or evolution of the designs of gages and of methods of gaging, together with methods of measuring gages, have given rise to a technique in metrology quite different from and greatly advanced beyond that which existed, except to a very limited extent, say 20 years ago. The ultimate resources of the metrologist by way of precision of measurement are called upon for a certain class of work, the measurement of precision gage blocks, where routine measurements to the millionth of an inch are not uncommon. Moreover this technique is coming to have an increasingly wide application in fields other than strictly the manufacture of interchangeable machine parts.

The technical definition of a gage which I have given is, I believe, concise, but because the word as generally used does have several meanings, it will help to clarify our conception of what constitutes a gage to distinguish between dimensional standards, measuring

Digitized by Google

instruments, and gages, and to note the principal subdivisions under each of these classifications.

A dimensional standard is, of course, as you well know, a specimen or model set up and established by authority as a basis for measurement, as, for example, the national prototype meter No. 27 in the custody of this bureau, or the set of length standards in any manufacturing establishment to which all measurements within the organization are ultimately referred. Dimensional standards may be classified as line standards, contact or end standards, precision screws, optical or light-wave standards, and angle standards.

The means for applying one or more of these standards to a piece of work to obtain a result which may be expressed numerically—that is, to determine a dimension or obtain a measurement—is known as a measuring instrument. The various classes of measuring instruments and the types of dimensional standards may conveniently be considered together in further detail.

As common examples of line standards applied as measuring instruments we have rules, scales, and tapes. In the manufacturing plant they are applied in such instruments as the vernier caliper, vernier height gage, and gear-tooth caliper.

Contact standards are generally, however, the basis of gaging operations. These have various forms, the most important of which are precision gage blocks, which have a commercial accuracy of 2 to 5 or 10 millionths of an inch, in length and parallelism and flatness of surfaces for lengths up to 1 inch, and corresponding accuracy per inch for longer blocks. Their advantages are too numerous to consider in detail at this time, but are derived principally from the fact that their method of manufacture is such that this high degree of accuracy is readily attained commercially, and that individual blocks may be combined to produce any desired dimension within the range of the set.

Other types of contact standards are spherical-end standards, and others of similar shape having flat or cylindrical ends. Also steel balls and cylinders are sometimes used as dimensional standards.

Contact standards are frequently used for setting or checking of the same types of measuring instruments as those to which line standards are applied. On the other hand they are most useful in setting various types of gages to size, and in checking gages, as we shall see later.

The precision screw is applied as a length standard in the micrometer caliper and other types of micrometer, such as the inside micrometer, micrometer depth gage, bench micrometer, and in the head of a universal measuring machine.

Optical or wave-length standards consist in the wave length of light of certain spectrum lines emitted by certain gases, such as helium, cadmium, sodium, krypton, etc. The most common application of such standards is in the determination of length of precision gage blocks, and the instrument for accomplishing this is the interferometer, which takes various forms. By such means measurements are readily made to the millionth of an inch. For this purpose the instrument is used by the manufacturers of such blocks; it is also used by this bureau for certifying the dimensions of about 1,000 such blocks each year.

Digitized by Google

Time does not permit an explanation in detail, but we invite any who are interested in obtaining further information on this or other methods which I may mention, to visit the gage section in the northwest building.

Angle standards are of secondary importance, as angles may be derived from length measurements. The graduated circle is one form of angle standard, applied in such instruments as the protractor, and the projection lantern for measuring the angle of screw-thread gages. Angle standards are also available in the form of cone points, and of precision gage blocks having short faces inclined to the long edges.

One important means of deriving angles from length standards is the sine bar, which consists of an accurate straightedge to which are attached two hardened and ground plugs of the same diameter, usually spaced exactly 5 or 10 inches apart, and with the line through their centers parallel with the straightedge. The sine bar is always used in conjunction with a plane surface from which the heights of the plugs are measured. The difference in these heights divided by the distance between the centers of the plugs is the sine of the angle which the straightedge makes with the plane surface.

Having briefly considered dimensional standards and measuring instruments, we now come to the third division, gages. From the distinctions which have been made you will see that on occasion a dimensional standard or measuring instrument may be used as a gage, and a gage may occasionally be used as a standard for a dimension, or for a set of dimensions, as such constituting a master, reference, or setting gage; but a gage, with certain rare exceptions, can not be used as a measuring instrument.

Gages may be classified in various ways, but I prefer to consider them under four principal headings; namely, fixed-size gages, indicating gages, progressive gages, and functional gages.

A fixed-size gage represents a specific dimension or set of dimensions. It may be adjustable as to size, but once the adjustment is made it is fixed. Fixed-size gages are commonly used as limit gages; that is, they are used in pairs, one of the pair representing the maximum dimension and the other the minimum; one being designated as the "go" gage because it enters or goes over the work, and the other being designated as the "not go" gage because the work should not assemble with the gage, if the work is correct. Such gages show that the work is somewhere between the limiting dimensions represented by the gages, or that it is outside of such limits. Limit gages are used in manufacturing to a very large extent. Types of fixed-size gages are plain gages (such as, plain plug, ring, and solid snap gages), screw-thread gages (such as, screw-thread limit plug, ring, and adjustable snap gages), profile gages (such as simple contour or receiving gage), and position gages for position of lines, shoulders, or holes, (such as surface gage and shoulder-locating gage).

Indicating gages differ from fixed-size gages in that one of the gaging contacts is movable and actuates an indicator, such as (1) a pointer moving over a scale, (2) a sliding bar the end of which is read with reference to a pair of ruled lines or with reference to a

Digitized by Google

notched surface, (3) a column of liquid the top of which moves relative to a scale, (4) a light beam and system of mirrors known as an optical lever, (5) a spirit level, or (6) an electrical device. By means of indicating gages the variations of the work from the size to which the gage is set may be measured. An indicating gage is a close approach to a measuring instrument, but it is commonly used merely as a limit gage, or to assort work into various size ranges. It can not be used independently of standards not embodied in the machine, or of setting gages, and hence it is not a measuring instrument.

A progressive or combination gage is a series of gages assembled into one unit and used for inspecting successively a number of independent dimensions on the same part. In its more elaborate forms it may be an automatic gaging machine having a hopper into which parts are fed and from which they emerge assorted as to size. Gaging machines for steel balls have been in use for at least 20 years, but in recent years there has been considerable development of machines for inspecting parts used in telephone equipment and other apparatus.

Thus far we have considered gages for individual parts but it is also frequently necessary to gage an assembled mechanism to determine whether the mating parts function properly; for example, a fixture for testing the running qualities of a pair of mating gears. Such a gage is known as a functional gage.

It may be of interest to you now to consider some of the means available for determining the size of a cylindrical hole, as an example, by way of reviewing the ground which we have covered. We have as measuring instruments the scale and caliper, the vernier caliper, the dial micrometer (applying line standards); the inside micrometer, made in a variety of forms (applying precision screw); gage block combination (applying contact standard); the plain plug limit gage, the telescoping inside gage, pin gage, adjustable limit pin gage (fixed size gages); and a variety of internal indicating gages, including the internal micrometer or adjustable plug gage, the star gage, ring gage comparator, etc.

Similar lists might be compiled for determining external diameters, distances between flat surfaces, center distances, angles, radii, composite dimensions. Other lists might be compiled relative to determining the dimensions of common machine elements such as ball and roller bearings, cams, dovetails, gears, keys and keyways, and screw threads. In addition, there are many more gages designed for a particular purpose, not so readily classified, such as a gage for the lip clearance and other dimensions of a twist drill, a gage for the alignment of an assembled engine piston and connecting rod, or a set of gages for a watch escapement to check the angles on the escape-wheel teeth, position of forks, pallet stones, etc.

In conclusion, as a further example of the application of gaging methods, which should be of particular interest to this audience as the measurement of a lever arm is involved, let me describe to you a gaging apparatus which we made and used here at the bureau to determine a distance on an electric dynamometer used in testing automobile tires. The set-up consists of two dynamometers, one used as a motor to drive the tire and the other as a generator to

Digitized by Google

absorb the power. The torques of the motor and generator are determined by weighing scales, and the power absorbed by the tire is determined from the difference in the torques. The distance in question was that from the axis of the shaft to the knife-edge upon which torque measurements were made. Access to the shaft of the machine was to be had at the ends, which were of different diameters. Accordingly a rectangular U-shaped steel frame was made up. The sides of the frame had V notches to fit over the exposed ends of the shaft. The cross member of the frame was attached by dowel pins and screws to the side arms. In order that this cross member should be parallel to the axis of the shaft, the distance from the dowel in one arm to the center of the V notch was equal to the corresponding distance in the other. For rigidity the cross member was countersunk in the side arms. Opposite each end of the knife-edge a dial indicator was mounted on a cross member. Mounted upon the knife-edge was a cylinder 2 inches in diameter from which a sector was removed, the angle of which was the same as that of the knife-edge. In order that the sector would have a sharp bottom the cylinder was made of two parts fitted together with screws. Indicator readings upon this cylinder in position were made successively with each indicator.

The entire apparatus was then removed from the dynamometer and the notches of the side bars were fitted over a ground shaft having end diameters corresponding to the diameters of the dynamometer shaft. Combinations of precision gage blocks were inserted between the shaft and the indicators, of such length that the indicator readings previously made upon the cylinder were reproduced. The other measurements necessary were the diameter of the shaft and the diameter of the knife-edge cylinder, obtained by means of micrometer calipers. Thus the distance from the shaft axis to the knife-edge was the length of the gage block combination, plus the radius of the shaft, minus the radius of the knife-edge cylinder. The measurements in our problem were: For the generator, 15.492 inches$\pm$0.007 and for the motor 15.509 inches$\pm$0.005.

Regarding the bureau's functions in connection with the testing of gages I would say just a few words. From what has been said you will see that a very large variety of equipment is required to measure gages to a satisfactory degree of accuracy, and new devices are constantly being developed, in answer to new problems in measurement as they arise. To go into methods of checking gages in detail would be a long story. The bureau tests the dimensional standards and master gages of manufactures and trade associations, but only in exceptional cases undertakes to test or set the gages used in the inspection of product. The manufacturer checks his own inspection and working gages against the master or reference gages which we have certified for him.

(During the presentation of the above paper Mr. Fullmer exhibited many of the devices referred to and also illustrated by means of lantern slides a number of the machines and methods discussed.)

THE ACTING CHAIRMAN. It is gratifying to know that weights and measures departments are still active in improving their facilities for the testing of large-capacity scales, and I want to congratulate every official who has procured efficient apparatus of this

Digitized by Google

character or who has made plans to this end. At this time brief descriptions of two new outfits will be given, both of these having already been put into service; plans for a third outfit will also be described.

NEW EQUIPMENTS FOR TESTING LARGE-CAPACITY SCALES

PAPER OF I. L. MILLER, COMMISSIONER OF WEIGHTS AND MEASURES, STATE OF INDIANA

Every inspector of weights and measures, whether State or local, has soon realized that the light testing equipment usually supplied the inspector for testing wagon and auto-truck scales is entirely inadequate. Ideally, of course, the equipment should be such that the scale might be tested to nearly its full capacity. Perhaps such an equipment is practicable for use in cities and counties, provided funds for its construction are available. Since, however, many of the new auto-truck scales are of capacities up to 30 tons it is scarcely practicable, due to road conditions and long hauls, for State departments to provide and maintain testing outfits heavy enough to test such scales with loads even approaching their full capacities. The increasing number of larger scales makes it the more necessary that larger testing equipments be provided that have been usually found in operation by State departments. With these facts in mind, the Indiana State Department of Weights and Measures endeavored for several years to obtain funds for the construction of an equipment of much larger capacity than had been previously provided. The funds were finally obtained and the new equipment placed in service almost a year ago.

The new test car has a gross carrying load of 14,000 pounds when carrying its full complement of weights consisting of ten 500-pound units and twenty 50-pound units. From the results obtained with this new equipment the inability of the small testing outfit to show defects existing in the larger capacity scales is clearly demonstrated.

During the last 6-month period 323 auto-truck scales and 121 wagon scales have been tested. Eighty-eight of the 323 auto-truck scales were found in error by amounts greater than permitted by the tolerances. Twelve of the condemned scales showed a plus error with a load of 3,000 pounds. When the load was increased to 12,400 pounds the error became minus. Likewise 28 of the condemned scales showed a minus error with a 3,000-pound load, but a plus error when the load was increased to 12,400 pounds.

Sixty-eight of the 121 wagon scales were condemned. Of the 68 condemned scales, 19 showed a plus error with a light load, but this changed to a minus error when the load was increased to nearly full capacity. On the other hand, 31 of the condemned wagon scales showed a minus error with a light load, which changed to a plus error when the load was increased.

In an Indiana county the local inspector had tested 28 scales and passed them as meeting the tolerance requirements. His total test load had been 3,000 pounds. When the same scales were tested with the State equipment 22 of the 28 scales were condemned because they did not meet the tolerances or because defects were discovered which made repairs and adjustments necessary. The local inspec-

Digitized by Google

tor had done a good job so far as his equipment would permit, but the inaccuracies and defects found could be discovered only through the use of a much heavier outfit than he possessed.

In this same county the local inspector, upon testing a 22-foot, 6-ton wagon scale, found a deficiency of 30 pounds on a 3,000-pound load. When tested by the State inspector with 3,000 pounds of test weights, practically the same deficiency was found; when the State car, weighing approximately 10,000 pounds was placed on the platform, the deficiency increased to a little more than 500 pounds; when the 3,000 pounds of test weights were added the scale indicated an addition of only 1,620 pounds, showing a deficiency of 1,380 pounds; the total deficiency of the load had now increased to almost 1,900 pounds. This scale with a slight adjustment would have been passed by the local inspector with his light testing equipment.

The facts above detailed indicate clearly that heavy testing equipment is absolutely necessary in the testing of large-capacity scales if more than minor defects are to be discovered.

The Indiana department's new testing equipment is not of as large capacity as is desirable, but is as large as the department can maintain until such time as additional outfits can be provided, making its possible to confine each outfit to a comparatively small portion of the State.

The following brief description of the equipment may be of interest to those who are considering the purchase or construction of new testing outfits.

Chassis.—The chassis is a model 140 Indiana truck chassis with a 6-cylinder engine and with a gross load carrying capacity rated at 14,000 pounds. The wheel base is 138 inches. The tires are 34 by 7 inches, of the balloon type, with dual tires on the rear wheels. The chassis is of sturdy construction, powered with a large, well-constructed engine, geared for four speeds forward, and reverse.

Body.—The truck body and driver's cab was built as a single unit by a local body builder. The over-all length of the body and cab is 202 inches and the over-all height 66 inches measured from the floor. The body proper is 70 inches wide at the belt line and 62 inches wide at floor level. The load-carrying space is 102 inches by 62 inches. The floor is 1-inch oak provided with angle irons properly spaced for carrying the 50 and 500 pound units. Four of the 500-pound units are carried immediately in the rear of the driver's seat arranged side by side across the width of the bed. The remaining six 500-pound units are arranged in a line extending toward the rear of the truck and immediately under the I-beam track. The twenty 50-pound weights are evenly distributed on each side of the six 500-pound units. Tool boxes approximately 54 inches long, 13 inches high, and 15 inches wide are built over each of the rear wheels. The roof is covered with ⅜-inch beaded ceiling with oak slats on the side walls spaced 3 inches wide. The entire cab and body is covered with sheet metal. The main body is provided with double doors in the rear and with a single door to the right and immediately in the rear of the driver's seat. The loading floor is supported by five floor braces of 4 by 1¾ inch channel iron, weighing 10 pounds to the foot, which are connected with uprights and top channel irons 3 by 1½ inches which serve as a support for the 5-inch I-beam carry-

Digitized by Google

ing the ½-ton ball-bearing spur-gear chain fall. All channel irons are wood filled. The 5-inch I-beam is movable and may be extended outside the body about 2 feet. When not in use the beam slides inside the body and is mechanically locked in place. The beam in no way interferes with the closing of the rear doors. The ½-ton ball-bearing spur-gear chain fall makes it possible for one man to easily load or unload the 500-pound weights.

Weights.—The dimensions of the 500-pound weights as cast were 11½ by 11½ by 15½ inches and each contained an oval cavity 4 by 8 inches for the addition of weight-adjusting material. It was intended that these weights be machined in such manner that the base would be somewhat larger than the top. The dimensions did not permit of such tapering of the weight. Further difficulty was encountered because of the extreme hardness of some of the scrap iron used in casting. This iron was of such hardness that the machining tools were quickly ruined. While it is possible to have castings made that are smooth enough that machining may be dispensed with, it is felt that machined surfaces offer much less chance for wear and for the collection of dirt in rough parts and in sand holes. When weights are to be machined very strict specifications should be made for the casting and the quality of iron to be used. When machining is contemplated, it is suggested that the dimensions above given be changed to provide for a base 11¾ by 11¾ inches and a top 11½ by 11½ inches with the height remaining at 15½ inches. These dimensions would give a casting weight of somewhat more than 500 pounds. The 500-pound weights now carried with the equipment and here described, have machined surfaces painted with aluminum paint. The form of these weights, which departs somewhat from that generally used heretofore, has proved very satisfactory when used with the hand cart, described below.

Hand cart.—The dimensions for the hand cart given in this paper differ somewhat from those of the cart which was actually constructed. The cart as constructed was designed for use with 1,000-pound weights and is larger and heavier than is necessary for use with 500-pound units. The wheels are standard model T Ford front wheels, complete with tires, tubes, rims, spindles, bearings, nuts, spindle arm, and spindle bolt. The arch is constructed of a single piece of channel steel ½ by 4 inches with 2-inch flanges. The wheel bearings should be firmly bolted to the legs of the arch. The handle is of wood approximately 3 by 3 by 65 inches. The handle brace plate is a single sheet of steel boiler plate $\frac{3}{16}$ inches thick, 14 inches wide, and 20 inches long. The dee handle is made from ¾-inch round steel rod. The hook for picking up the weight should be either of square or rectangular iron so shaped as to engage the handle of the weight firmly in order to prevent side swinging and turning of the weight. In the cart now in use the hubs of the wheels extend outward about 4 inches. These extensions cause much inconvenience. Preferable dimensions would provide for a hub extending only 1 inch from the wheel. This can be accomplished by cutting off the original hub and using a cotter pin to hold the wheel in place. With the cart described, one man can easily move the 500-pound units to the various positions on the scale platform.

Digitized by Google

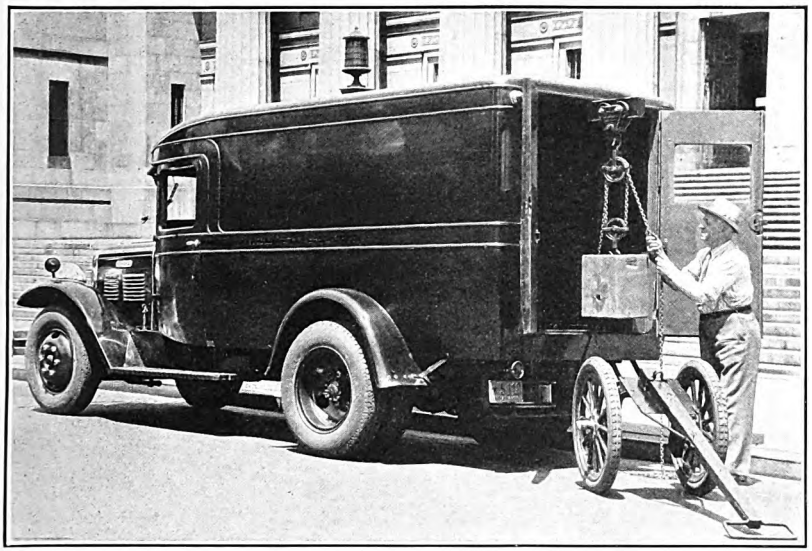


FIGURE 2.—*General view of large-capacity scale-testing equipment of the State of Indiana*

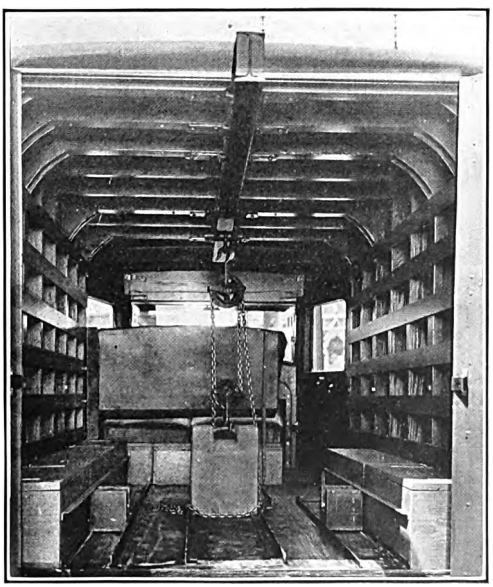


FIGURE 3.—*Interior of Indiana State testing equipment*

Digitized by Google

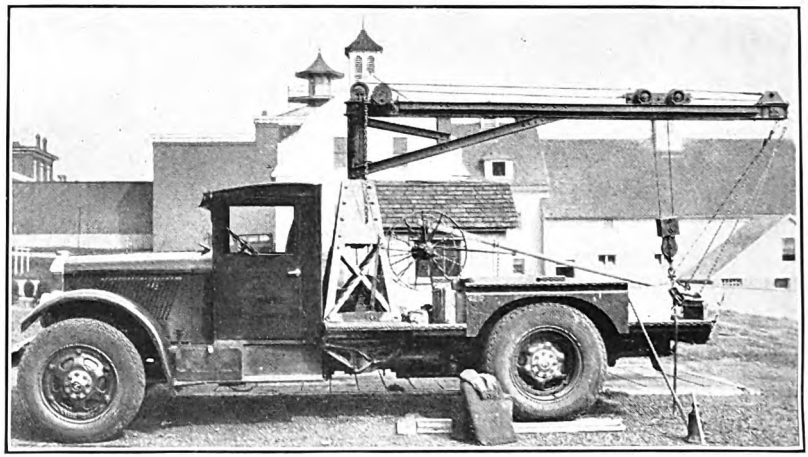


FIGURE 4.—*General view of large-capacity scale-testing equipment of Monroe County, N. Y.*

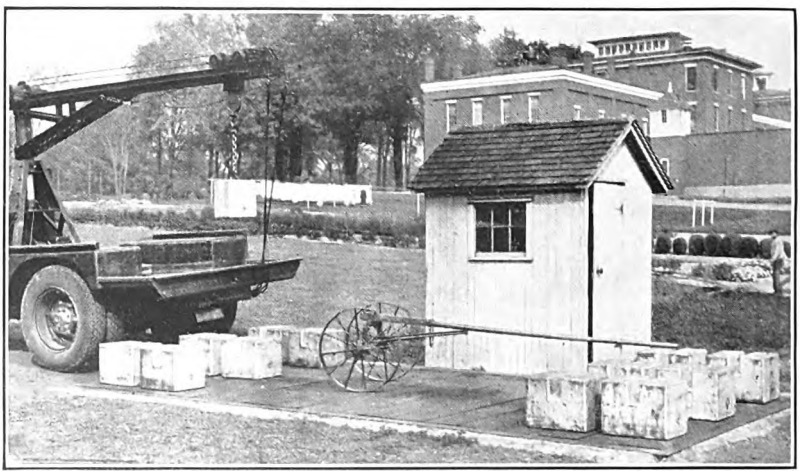


FIGURE 5.—*Unloading 1000-pound weights onto scale platform. Monroe County, N. Y., equipment*

Digitized by Google

The equipment now in service has been found very satisfactory. Two men handling the equipment can make the usual tests on wagon or truck scales in about 40 minutes. As already pointed out, it has shown defects in scales which have been constantly overlooked when testing with our small equipments.

We gratefully acknowledge the assistance and advice rendered by W. L. Frank, of the United States Bureau of Animal Industry, in completing plans and specifications for the hand cart and large-unit weights, and of the information and assistance received from the National Bureau of Standards. Without such assistance our task would have been much more difficult and our equipment less efficient.

(Before the presentation of the above paper, Mr. Miller placed in the hands of those in attendance specifications of the equipment as well as cuts showing details, and he also illustrated the equipment by means of lantern slides.)

DISCUSSION OF ABOVE PAPER

Mr. SWEENEY. Mr. Chairman, I would like to ask Mr. Miller a question. I noticed several of those weights were set under the seat. How do you lift them?

Mr. MILLER. Those weights can be taken out with the falls, if you wish to do so. I might say the truck is provided with closing doors at the rear end, and there is a side door which gives access to the space in the rear of the driver's seat.

Mr. C. P. SMITH. Is it not difficult to move those weights to the side?

Mr. MILLER. The inspectors have been able to do it.

Mr. ROGERS. What was the price you paid for your weights per unit? Is there any material advantage in having the weights painted with aluminum paint?

Mr. MILLER. I do not know the exact cost. The cast iron costs 4 cents a pound, or $20 for a 500-pound weight, but, as I said, the machining of the weights cost two or three times the cost of the castings. When we received them we painted them with aluminum paint, and we found we could better the process by adding varnish, which gave a much harder surface and one that was much smoother. We find it preserves the weights materially.

Mr. HARRISON. I think perhaps Mr. Rogers and Mr. Miller would like to know, if they do not already know, that the Bureau of Standards is conducting tests in covering test weights. I do not think it would be well to draw conclusions at this time, but a report will doubtless be made by them in due time.

PAPER OF W. A. PAYNE, SEALER OF WEIGHTS AND MEASURES, MONROE COUNTY, N. Y.

Mr. Chairman and members of the conference, I have had in mind for some time trying to procure a larger equipment for the testing of our auto-truck and wagon scales. It was only a very few years ago that I had in our county no large scales of the above-mentioned type. They were nearly all wagon scales of from 4 to 10 tons capacity, and very few of the latter. Now the scales in use are

Digitized by Google

nearly all of the larger type, 10 to 24 tons capacity, so since I met with you at the conference last year I have been able to show the building commission of the board of supervisors of the county of Monroe the need of a larger testing equipment and they very generously gave me their support for this equipment.

Last September I was able to put in service a complete heavy testing apparatus. I have been in the county service of Monroe County, N. Y., for some 25 years and have done my wagon-scale testing with 20 to 40 fifty-pound weights.

First, I will give you an idea of the truck and weights. The truck is a 5-ton, 6-cylinder type with a piston displacement of 427 cubic inches, 100 horsepower at 2,200 revolutions per minute, 7-bearing crank shaft, force-feed lubrication to main connecting rod and cam-shaft bearings, five forward and two reverse speeds, mounted as a unit with engine. The rear axle is spiral bevel differential drive at center, with track gear and oscillating pinion, double reduction at the wheel, chassis mounted on live axle and below center of wheel. The propeller shaft is 3¼ inches in diameter, 3-piece construction. The frame is 11 feet back of cab, made of pressed steel channel, 8½ inches by 3½ inches by $\frac{5}{16}$ inches, reinforced throughout. It has two sets of brakes, operating independently, the service brakes are air operating on all four wheels and the hand brakes contracting on propeller shaft.

The forward springs are 3 inches by 42 inches, and have 12 leaves each, the rear 4 inches by 60 inches, 14 leaves each with 5-leaf helper spring.

The tires are 12-ply heavy-duty balloon, 900 by 24 forward and 975 by 24 dual in the rear, all six tires being equipped with heavy-duty puncture-proof tubes. The capacity of the fuel tank is 27 gallons. Truck has full electrical equipment. The chassis is equipped with a de luxe cab. The platform body is 7 by 11 feet, made of firm tread steel of $\frac{3}{16}$-inch material, 3-inch side rim all around body, with a square wheel housing over the rear wheels; all joints are electrically welded; no rivets or bolts in the platform body. The truck is equipped with a Mead-Morrison heavy-duty truck winch and crane, complete with 12-foot boom, which swings around the truck in a complete circle. The winch is driven by a flexible power take-off from the transmission, the body is low, only 28 to 30 inches from the ground when loaded.

We have a guaranty in writing that the truck will consistently carry and handle an overload of 75 per cent at all times. Included in this equipment are two heavy side jacks and one 12-ton hydraulic jack which I use in the garage when not removing all of the load. We simply place the two side jacks in a receptacle on either side of the frame and the hydraulic jack at the rear and raise them up so the relief springs are clear and free. We also have a heavy tarpaulin, 9 by 12 feet, which covers the entire body back of the cab.

The weights are made of cast iron, and the 1,000-pound weights are of the approximate dimensions as follows: 15 inches high, 15 inches wide, and 19½ inches long. The 500-pound weights are similar to the 1,000-pound weights with the exception of the dimensions, which are about 12⅝ inches high, 12⅝ inches wide, and 12⅝ inches long.

Digitized by Google

They all have a lifting handle made of machine steel, about ¾-inch diameter, and cast in place in recess so that weights can be stacked one upon the other. The adjusting cavity is symmetrical about center line with a 2-inch countersunk plug at either end. All the weights are sealed to the accuracy of 1 ounce. The bottom of the weights are slightly recessed in order to have uniform bearing surface around the outer edge. The figures representing the value of the weights are also recessed and do not project.

The cost of the above equipment, truck and crane complete, was $6,877.06, and I use fourteen 1,000-pound weights and two 500-pound weights, also twenty 50-pound, costing $738.75. The 12-ton hydraulic jack and the tarpaulin mentioned above cost $50. I also have a dolly for moving the large weights around on the platform, which cost $70, making the total cost for the complete equipment $7,735.81.

The method we use in testing is as follows: First, we place our truck alongside of the scale platform and level it up. We carry some blocking and plank for this purpose as we soon found out that if our truck was not level or nearly so when we went to swing the boom with a 1,000-pound weight to the platform it was not an easy thing to do, but if the truck was level it was a very small effort to swing the boom where you wanted to place the weight on the platform. We observe that the scale platform is free and clear and the scale in balance. On a large scale we place two of the 1,000-pound weights on one end of the scale directly over the bearings, and record the reading of the beam; then we add an additional ton on the other end and record the reading as before. We continue to add so our total is from 12,000 to 16,000 pounds placed upon the platform. If this test is satisfactory, we sometimes dolly the weights off to the side of the scale platform and place our truck upon the scale and record the tare weight—in our case the truck weighs about 14,400 pounds empty. We then hoist the weights back on the truck and observe whether there is an error between the truck weight and the additional known weight of the weights.

I usually carry about 12,000 to 16,000 pounds of weights, which would make our total about 30,000 pounds when all the weights are on the truck. The use of the dolly is invaluable in moving the weights around on the scale platform or on or off the scale as the case may be. I do not generally add the weight of the truck to the test weights unless the scale shows an error at 12,000 to 16,000 pounds. If the scale tests satisfactorily at the above weight I generally seal it, for I believe in most cases if a scale is going to be faulty above this test you will observe it long before you have this amount of test weights on the scale platform. I found more scales in error from this heavy test than I had observed under the old method of testing, but far less than I had expected.

After this test, which we believe is a good one, we leave the scale with the satisfactory feeling that we have done a better job than we have ever been able to do before.

(During the presentation of this paper Mr. Payne illustrated by means of lantern slides the equipment and the method of test described.)

Digitized by Google

DISCUSSION OF ABOVE PAPER

Mr. CROCKETT. Mr. Chairman, I would like to ask a question. Is that equipment used in rainy weather?

Mr. PAYNE. We use the weights pretty constantly.

Mr. CROCKETT. Is there any difference?

Mr. PAYNE. No; we throw a canvas over them.

REMARKS OF FRANCIS MEREDITH, DIRECTOR OF STANDARDS, STATE OF MASSACHUSETTS

Mr. Chairman and gentlemen, we recognize in Massachusetts, in common with others, the necessity for something in the nature of a large-capacity scale-testing equipment. So, profiting by the experience of others, we started out. We have moved very deliberately and yet certainly in the direction of the obtaining of an apparatus of the kind. I am not prepared to say very much about it at this time for the reason that I have had greater responsibilities that required time and attention. However an appropriation of $7,000 was secured. Later on the contract was let for the truck and at the present time we know what the chassis and the hoist are like. I have not paid any attention to the matter of weights or the matter of procedure or maintenance or anything of that kind.

I had in mind two fundamental ideas: One was that we should be provided with a truck itself of a weight of 15,000 pounds and the ability to carry 16,000 pounds of 500-pound weights. The other was to eliminate in so far as possible, the element of danger to the personnel, so that in the use of this truck there will be no handling of a boom, no use of a trolley or dolly. With the 120-horsepower engine we have sufficient power to handle the weights with perfect safety. The weights will be swung from the boom, and moved by means of levers. The boom will be moved in a similar fashion and the operator will have no occasion to touch the weights at all. As a matter of fact it is designed that he shall be free and clear from the field of danger.

(Mr. Meredith illustrated the equipment discussed by means of lantern slides.)

DISCUSSION OF ABOVE REMARKS

Mr. MILLER. Mr. Chairman, I am very glad to get this information. It might be interesting for me to state that our completed truck cost only one-half the figures that these gentlemen are mentioning.

Mr. MEREDITH. We are going to have a real truck.

Mr. STRONG. I would like to ask the Major how he will operate his truck in the case of inclosed scales?

Mr. MEREDITH. I have never attempted and do not intend to cross a bridge until I come to it, but I think in all my years of life I have heard the expression, "There is nothing impossible under the sun," and there may be a way by which those weights can be moved onto the scale under cover and we may try to find some way to accomplish it.

Mr. GRIFFITH. Do you provide for a dolly?

Mr. MEREDITH. We will not employ a dolly.

Digitized by Google

Digitized by Google

Digitized by Google

GENERAL CONSIDERATION OF SUBJECTS OF INTEREST AND QUESTIONS BROUGHT UP FOR DISCUSSION BY OFFICIALS

LIQUID MEASURES OF NONSTANDARD SIZES

Mr. GRIFFITH. Mr. Chairman, under this subject, there is one item that I want to bring up. It seems that some manufacturers of liquid measures are introducing on the market sizes which are not permissible under the present specifications. I speak particularly of 5, 6, and 7 quart measures which have been found in our jurisdiction, but have not been permitted in use. The reasons offered for their introduction is their facility. Some of the vehicles, of the smaller type, have a crank case capacity of 5 quarts and garage people are insisting on using a 5-quart measure. I thought it might be interesting to have the conference look at some of these that we have confiscated [exhibiting measures]. Under the specifications they are not permissible as you know, but because of the fact that they are in use it would seem that we are not strict enough in our enforcement.

Mr. LEITHAUSER. I would like to give some experiences I have had in Baltimore. In the course of a regular inspection I went into a garage and found a 5-quart measure. I told the operator it was illegal and confiscated it, and took him to the police station to make a charge. I also found that some manufacturer was shipping into our city a measure marked "5-quart liquid container." I would like the conference to put something in the specifications for liquid measures to eliminate that. Can any container having its capacity stamped or marked in it in any way be considered a measure?

The ACTING CHAIRMAN. I am sure we would be glad to hear from Mr. Holbrook.

Mr. HOLBROOK. Well, we have a measure here marked "5-quart liquid container." If that is used in filling a crank case and 5 quarts is charged for, it occurs to me that you could proceed against the man for using as a measure that which purports not to be a measure or for using an illegal measure for determining the quantity of oil delivered. It occurs to me that a man who determines 5 quarts of oil and charges for 5 quarts of oil, by the use of a container which is not a legal measure, could be proceeded against in the majority of the States.

I may say that the committee on specifications and tolerances has been requested at various times to include in the specified sizes allowable 5, 6, and 7 quarts. However, the committee believes that standard measures should be limited to the sizes already specified. To do otherwise is to open an avenue which will extend out of sight in the distance. In times gone by the proposition has been made that we recognize the one-seventh quart measure on the ground that when cream is 35 cents a quart one-seventh of a quart represents 5 cents of liquid. Similarly we might have a one-fifth quart measure on the ground that whenever anything sells for 25 cents a quart one-fifth is worth 5 cents. In that way you might multiply the number of measures to legion with resulting loss of perception of standard sizes in the measures used. To my mind it is extremely dangerous to get away from our binary multiples and binary submultiples of the gallon. The committee on specifications and tolerances after consideration has always refused to recognize these odd sizes which manu-

Digitized by Google

facturers are attempting to put upon the market. We are now asked for 5, 6, and 7 quart sizes. Suppose a manufacturer brings out an automobile having a crank case capacity of 7½ quarts of oil; then that new size measure would be in line for recognition under precedents that are now being sought.

Mr. TINKEY. Mr. Chairman, I agree heartily with Mr. Holbrook's definition of that. That is the position we took in Ohio. I would like to know, and I believe others would like to know, when is a container a measure. I believe a definition such as that would help our understanding of this question. Now, I was always lead to believe that a container becomes a measure when it delivers a stated quantity of a commodity. If that is not a good definition, I would like to hear about it.

Mr. MEREDITH. In that respect our experience has been this: When there is a persistent assertion that a device is a container, a conveyor, ultimately it meant that there had to be a plain and conspicuous statement on such a device that it was not a measure and that it had to be filled by means of a sealed device. On the whole we are not troubled with that sort of thing any more than we are with 5, 6, and 7 quart measures. They are not recognized as measures and consequently are taboo. They are not sealed.

LUBRICATING-OIL BOTTLE OF IMPROPER TYPE

Mr. ROGERS. Mr. President, there is a certain type of lubricating-oil bottle coming on the market which appears to be contrary to the code. It has a depressed ring near the base obviously placed there for convenience of handling; however, the code requires that the bottle shall be so designed that drainage will not be obstructed. We take the position in New Jersey that that type of bottle is illegal and we do not approve them. The representatives of the oil company know it, so that they do not ship them into New Jersey.

TWO METERS IN ONE HOUSING FOR DISPENSING DIFFERENT GRADES OF GASOLINE

Mr. CROCKETT. Mr. Chairman, there is a subject that I would like to bring up, namely, the subject of twin gasoline dispensing pumps or meters dispensing two grades of gasoline. Several manufacturers have prepared different kinds, some with housing going to the top, some with the housing split in the middle, the upper portion being two separate units, and some with the units separate almost from the base. In the city of Baltimore we made them use the last-mentioned type. Some of the manufacturers have stated that when two kinds of gasoline are dispensed from such double unit it can be made readily discernable by painting the two sections of the pump in different colors, according to those used by the various gas companies. I saw one of these meters in town that is solid all the way to the top. One part is painted orange and the other deep yellow, distinguishing colors it is true but a person who is color blind could not distinguish the two colors. If a person does not watch what he is getting, he may get straight gas when he pays for a premium fuel. We think the conference should consider that and take some action on the design of gasoline meters.

Digitized by Google

Mr. ROGERS. Is not that a matter of quality rather than quantity? That constitutes a misrepresentation, and any aggrieved party would have a remedy in law.

Mr. CROCKETT. In Baltimore we do as much to protect the consumer as we can, as the buyer is not an expert.

Mr. ROGERS. Does your jurisdiction extend over such matters?

Mr. CROCKETT. Absolutely.

The ACTING CHAIRMAN. The Chair would suggest, in order to dispose of this matter, that you make a motion for the conference to consider and act upon.

Mr. GRIFFITH. Mr. Chairman, I did not quite understand the question.

Mr. ROGERS. It is just a matter concerning quality.

Mr. GRIFFITH. The quality of the liquid is not the primary subject involved—it is the use of an instrument that will allow the perpetration of a fraud. When there are two instruments in one case, one for one kind of gasoline and one for another, the opportunity to perpetrate fraud is so apparent that I think the matter should be given consideration.

Mr. ROGERS. I can readily see how substitution could take place.

The ACTING CHAIRMAN. The Chair is ready to receive any motion concerning this matter.

Mr. STRONG. If there is nothing more to come before the conference this afternoon, I move we adjourn.

(The motion was seconded, the question was taken, and the motion was agreed to.)

(Thereupon, at 5.07 o'clock p. m., the conference adjourned to meet at 9.30 o'clock a. m., June 5, 1931.)

Digitized by Google

SEVENTH SESSION (MORNING OF FRIDAY, JUNE 5, 1931)

The conference reassembled at 9.35 o'clock a. m. at the Mayflower Hotel, Dr. George K. Burgess, president, in the chair.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON SPECIFICATIONS AND TOLERANCES FOR ODOMETERS, AND ON MISCELLANEOUS ITEMS RELATIVE TO OTHER CODES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN

The code of specifications and tolerances for odometers, adopted tentatively last year, has been found to be entirely satisfactory. Therefore, your committee recommends at this time that this code be finally adopted, without amendment, by the present conference.

In relation to miscellaneous items relative to other codes, your committee has to recommend the transfer of certain specifications in our present codes, from the subheading "Specifications" to the new subheading "Regulations," under the appropriate main heading, and the replacement of these by new specifications relating to the same subject matter; and the amendment of certain other requirements by the addition of new material.

Your committee also recommends the final adoption at this time of a specification requiring the indication of an exhaustion of supply in the case of grease-measuring devices. The text of the specification recommended is the same as that which has been carried for several years in a "general note" at the foot of this code suggesting that this requirement might be adopted at some time in the future. In the case of the latter proposal your committee recommends that this be not put into force prior to July 1, 1932, and that it be nonretroactive.

The text of the various modifications now proposed was placed in your hands several days ago.

Respectfully submitted.

(Signed) F. S. Holbrook, *Chairman*,
I. L. Miller,
Joseph G. Rogers,
W. A. Payne,
Committee on Specifications and Tolerances.

DISCUSSION OF ABOVE REPORT

Mr. Holbrook. I move that we finally adopt the code of specifications and tolerances on odometers, as tentatively adopted last year.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. Holbrook. The first of the miscellaneous items recommended is to transfer specification No. 20 under the heading "Liquid-

Digitized by Google

measuring devices" to the subhead "Regulations," without amendment, and insert in lieu thereof a new specification to be numbered "20" and to read as follows:

20. PISTON DISPLACEMENT.—A defined-stroke liquid-measuring device shall be so designed and constructed that it will have a piston displacement per cycle, of 231 cubic inches per indicated gallon of delivery.

The specification in our code recommended to be transferred and amended is headed "Use of adjustments" and reads as follows:

20. USE OF ADJUSTMENTS.—No adjustment of the delivery of a defined-stroke liquid-measuring device shall be permitted except that intended to produce a piston displacement per cycle, of 231 cubic inches per indicated gallon of delivery. Adjustments of piston displacement to correct for leaks, slippage, excessive length of pipe line, or other defects of the device or of the installation shall not be permitted.

Now, that is obviously a regulation under our definition, because it refers to adjustments in the field. It seems then that that is properly to be transferred to "Regulations." However, a specification in relation to piston displacement for new devices, for the information of the manufacturers, should be included in the code and for that reason the new specification, which is recommended, has been written.

The next recommendation is to transfer specification No. 16 under the heading "Grease-measuring devices" to the subhead "Regulations," without amendment, and insert in lieu thereof a new specification to be numbered "16" and to read as follows:

16. PISTON DISPLACEMENT.—A defined-stroke grease-measuring device shall be so designed and constructed that it will have a piston displacement per cycle, of 28.875 cubic inches per indicated pint of delivery.

The situation in relation to this specification is identical with that just described under the similar specification for liquid-measuring devices.

Mr. SWEENEY. Mr. Chairman, I would like to ask Mr. Holbrook a question. The other evening there was displayed a grease-measuring device in which the complete cycle of the indicator was a pint, but to deliver this it was not only necessary to make a revolution of the handle which operation would bring the indicator part way around the face of the dial but also to reverse the direction of motion of the handle to complete the cycle. I wonder if that would comply with this specification.

Mr. HOLBROOK. You mean you have to crank the handle back to the starting point to obtain full delivery?

Mr. SWEENEY. Starting at zero you make a forward turn, bringing the indicator about three-quarters around the face of the dial, and in completing the stroke you have to reverse on account of the system of gears, working it backward and forward until it reaches the desired point.

Mr. HOLBROOK. I am unfamiliar with that device.

The next recommendation is to amend the code of specifications for grease-measuring devices by adding a new specification to be numbered "20," and to read as follows:

20. INDICATION OF EXHAUSTION OF SUPPLY.—*All grease-measuring devices shall be provided with a device which will make the unit inoperable when the supply of grease or transmission oil has reached a point where the accuracy*

Digitized by Google

of delivery would be affected, or shall be so constructed as to warn the purchaser and the operator in a conspicuous and distinct manner that the level of the supply is so low as to endanger the accuracy of the measurement.

It is recommended that this specification be not put into force and effect prior to July 1, 1932, and that it shall be nonretroactive.

Now, gentlemen, as you realize, this is an important specification. It has been carried in our code for several years in the form of a note rather than of a specification, the note indicating that at some time in the future the conference might deem it advisable to adopt a specification of this character. It seems to be rather the consensus that this specification is the keystone of the grease-measuring device arch, in that without this specification a full delivery will not and can not at all times be guaranteed to the purchaser. We all know that upon some devices the cranking of the indicator will represent the delivery of grease upon the indicating elements of the pump, although no grease in fact may be delivered if the level of the grease in the device is too low. Therefore, the specification is recommended for adoption at this time.

Formerly a device of the character mentioned in the requirement was almost unknown; later, while not unknown, they were uncommon. Your committee is now informed that there are a large number of devices on the market which comply with this specification and that there are a number of means available by which the specification can be complied with. This being a new specification, under our usual procedure, it would be adopted tentatively and laid on the table for a year, then, if satisfactory, finally adopted to take effect some time after its final adoption.

After mature consideration your committee has decided that this procedure need not be followed in its entirety in this case. This has been carried in a note for several years and the language has apparently been satisfactory to the manufacturers and weights and measures officials. It is considered that this is equivalent to a tentative adoption of the specification, so far as familiarity with the specification is concerned. Therefore, in this case, it is recommended that this specification be finally adopted at this time to take effect approximately one year from date. It is thought necessary to postpone its effect for a year in order to give the manufacturers not having a device at the present time—and of course there are a number of them—an adequate opportunity to work out their devices and incorporate them in their finished product.

Mr. FLAHERTY. Mr. Chairman, I move you that this recommendation of the committee be adopted.

The CHAIRMAN. We have proceeded in the usual way, on the basis that, if there were no objections, a motion would be made at the end. If there is any objection to this, we may vote on this item separately.

Is there objection?

Mr. RAGLAND. I object to anything which will give a 12-month extension on this proposition.

Mr. FLAHERTY. The motion is that the item be approved as presented by the committee.

The CHAIRMAN. You may state your objection, Mr. Ragland.

Mr. RAGLAND. Mr. President and gentlemen, I believe you will agree with me that there is no need of giving 12 months more. We

Digitized by Google

have given 13 months, we have given 6 months, and the footnote there told the manufacturers plainly and explicitly what we expected. To be perfectly frank with you, no objection will be raised if you cut that 12 months off and make it 6 months. Last year you folks misunderstood me. On Tuesday we had a great victory. On Wednesday poor J. Harry Foley made the motion to postpone and I seconded it. I took my little brief case and went out. Somebody said "Rags is mad." As a matter of fact, I had a sick daughter at home and I drove home just as fast as I could. I have never been mad. I love to fight because I am a Welshman. I hope the conference will cut that 12 months out and make it 6. I move we substitute "6" for "12" months.

(The substitute motion was seconded.)

Mr. HOLBROOK. Mr. Chairman, I would like to say a word or two about this. It is suggested that the manufacturers will not object and that this proposition will involve an extension of time of 12 months. I do not believe that the word "extension" is well taken. I do not believe there can be said to be an extension of time when there will not have been a specification to this effect in the code of the conference prior to the time when this shall have been adopted. It is suggested that the manufacturers were duly notified that this specification would become part of the code but I submit that that is not correct. The general note now reads:

GENERAL NOTE.—Device to indicate exhaustion of supply.—The conference goes on record to the effect that it is its opinion that such a device as is mentioned in the following paragraph is a very desirable one, but considers that the time is not yet ripe to recommend its adoption. The conference suggests, however, that at some future time steps may be taken to incorporate the following paragraph in the code of specifications:

"All grease-measuring devices shall be provided with a device which will make the unit inoperable when the supply of grease or transmission oil has reached a point where the accuracy of delivery would be affected, or shall be so constructed as to warn the purchaser and the operator in a conspicuous and and distinct manner that the level of the supply is so low as to endanger the accuracy of the measurement."

Now, to go back a few years, in determining whether this language means that this is a regulation that the conference will adopt, let me say that 10 or 12 years ago [1] a specification similar to this was proposed for liquid-measuring devices. Its enforcement was postponed but the manufacturers were put on notice that something of this sort was desired and that the specification might be enforced in the future. In 1920 the material was put in the form of a general note—almost identical with the one we are considering here—and it was so carried in the specifications for liquid-measuring devices for several years. Finally, instead of being adopted as might have been expected, the note was dropped and the proposed specification is not included in our code, on account of the difficulties of arranging a device which would produce this effect.

This whole question, it seems to me, goes deeper than the question of this particular specification—it is a question of keeping faith by this conference with the manufacturers of devices. We all know

[1] At the Twelfth Conference, held in 1919, see pp. 192–193, Twelfth Annual Conference Report.

Digitized by Google

that the manufacturers of devices are our very good friends. We all know that cooperation between the manufacturers of devices and the conference will produce results. If we had no cooperation of the manufacturers, while the adoption of specifications would be easy, the putting of them into effect would be an extremely difficult and tedious operation and there would be a great deal of trouble involved in enforcing them.

Now it has been the policy of this conference, over a very long period of years, to allow one year from the date of the final adoption of a specification before the specification is to go into effect. I think that it is transcendently important that, regardless of what the specification is, the conference stick to its precedent in that regard. In that way I think that you will find that the cooperation of the manufacturers will be retained. To adopt any other method, to shorten this period, to appear to be radical in the immediate forcing of a proposition as important as this, would, it seems to the committee, be extremely unfortunate. Therefore, disregarding the particular specification at hand, I will ask you to think in voting on this question, of the importance of maintaining precedent in this regard, a precedent which has always been considered proper by the conference and by the manufacturers, and a precedent which is firmly fixed in the proceedings of this conference.

The importance of the specification is great, but think of this: This conference has existed since 1905 and for the first 23 years of its existence it did not pay any attention to grease-measuring devices at all. Grease-measuring devices were not mentioned. Why, then, should we quibble now about the adoption of a specification either six months or one year hence, when over this long period of time we have considered grease-measuring devices so unimportant that we have not legislated on them before?

Mr. RAGLAND. Mr. President, I have the highest regard for Mr. Holbrook. This question of grease-measuring devices is not a small matter. Do you gentlemen know that there was spent in the United States $30,079,000 in a year for gear grease alone? He speaks about quibbling. I conceded last year; I gave in and agreed to a six months' continuance. Mr. Holbrook is wrong—he is entirely wrong. Mr. Holbrook, do you know there are 14 equipment companies that do not want an extension?

Mr. HOLBROOK. I am speaking of the manufacturers who do not have it perfected.

Mr. RAGLAND. I was premature once, but I am telling you that there are 14 grease guns that will suit anybody's requirements, and the oil industry is satisfied. The equipment is satisfactory, and I ask you gentlemen one thing: Let us give them 6 months and not 12. The guns are ready and anybody who wants a grease gun can get it. The reason why I agreed with our dear departed friend, J. Harry Foley, was that I realized that great corporations make their annual budgets in January. We are meeting here in June . Let us be fair with everybody and honest with ourselves. Why, they are already complying with this in Pennsylvania, New Jersey, and Richmond. I will take my seat with this one statement—I yielded last year and I am not going to yield this time—we will give them six months, which is sufficient.

Digitized by Google

The CHAIRMAN. Gentlemen, the question is on Mr. Ragland's substitute motion which provides that the requirement may be put into effect in 6 months rather than 12. I remind you in voting that weights and measures officials only are entitled to vote.

(The question was taken, and the substitute motion was agreed to.)

Mr. HOLBROOK. The next suggestion is to amend specification No. 19 under the heading "Scales—General specifications," reading as follows:

19. Reading edges or indicators of poises shall be sharply defined, and all reading edges shall be parallel to the graduations on the beam.

by changing the period at the end of the specification to a semicolon and adding thereto the following words:

indicators shall reach to the graduations, or if the construction is such that the indicator and the graduations are in the same plane then there shall not be a separation of the ends of the graduations and the end of the indicator of more than 0.04 inch, this distance to be measured along the line of the graduations.

That makes the requirement for poises the same as for the indicator of automatic-indicating scales.

Transfer specification No. 23 under the heading "Scales—General specifications" to the subhead "Regulations," and amend to read as follows:

Wet fish or other wet commodities shall be weighed only on scales the pan or platform of which will properly drain.

and insert in lieu thereof a new specification to be numbered "23" and to read as follows:

23. The pan or platform of a scale intended for the weighing of wet fish or other wet commodities shall be so constructed as to provide for drainage.

Mr. BAUCOM. When you weigh pickles out of the brine you should always have a pan that will drain, and I was wondering if you should put in there "or other wet commodities."

Mr. HOLBROOK. The words "or other wet commodities" are already in the specification.

Mr. BAUCOM. That is all right then.

Mr. HOLBROOK. Amend specification No. 10 under the heading "Counter scales," by adding in line 11 after the words "removable weights" the following:

in the table under the heading "Tolerances," subject, however, to the limitations as to minimum tolerances which shall be allowed:

to make the specification read as follows:

10. All scales shall be so constructed that when a weight whose body has approximately equal diameter and height and which represents one-half of the capacity of the scale is shifted in any direction on the weight plate or on the commodity plate, pan, or scoop to a point one-half the distance between the center and edge of the weight plate or the commodity plate, pan, or scoop, the additional resulting error in the weight indication, due to this cause alone, shall not exceed the tolerance allowed at the load in question given in the column headed "Tolerance on parts requiring employment of removable weights" in the table under the heading "Tolerances," subject, however, to the limitations as to minimum tolerances which shall be allowed: Provided, however, That in this test the edge of the weight shall not be made to project over the edge of the weight plate or the commodity plate, pan, or scoop.

Digitized by Google

The next suggested amendment relates to the same subject. It is proposed to amend the paragraph headed "Tolerances" under the heading "Counter scales" by adding at the end thereof the following:

The minimum tolerances arrived at by application of the provisos above shall also apply in the shift test.

Let me say there has been a question in the minds of many as to whether minimum tolerances derived by applying the provisos in the introductory material to the tolerance table limited or did not limit the values to be applied in the shift test. In connection with the examination of post-office scales that question has been very prominent in the last year and the specification was not definite in that regard. It is felt by the committee that the proper solution of the question is to have minimum tolerances applied in all cases and the amendments have been so written as to produce this result.

Amend specification No. 3 under the heading "Automatic-indicating scales," reading as follows:

3. There shall be a clear interval between the weight graduations on the dial or reading face and this interval shall in no case be less than 0.04 inch. This interval is to be measured between the adjacent edges of successive graduations representing the smallest subdivision on the dial or reading face, and along the line of travel of the index of the indicator and shall be maintained whether or not the graduations are "staggered" or arranged alternately; that is, when the graduations are staggered the interval shall be construed to be the space from one graduation to the next consecutive graduation extended, if necessary, to intersect the line of measurement. When the graduations are not parallel the interval shall be construed to be the widest separation of the graduations which is included within the travel of the index of the indicator.

by adding at the end thereof the following:

When the graduations are not equally spaced throughout the range of the reading face the interval shall be measured between the graduations most closely spaced.

The specification provides for a minimum space between graduations but it was not stated in the case of nonequal graduations that the measurement should be on the shortest space. That seems to be a reasonable interpretation and matter has been written in to clear it up.

Amend "Definition" under the heading "Computing scales," reading as follows:

A computing scale is a scale which, in addition to indicating the weight, indicates the total price of the amount of commodity weighed, for a series of unit prices.

by adding at the end thereof the following words:

throughout all or a portion of the weighing range of the scale.

When a computing scale has a tare beam or employs removable weights the computing range of the scale is usually less than its total weighing range, yet strictly construing the definition it might be considered as requiring that a computing scale compute the value of every load which can be weighed. The reason these words are recommended to be added is to clear up that slight ambiguity.

Digitized by Google

The CHAIRMAN. That concludes the report of the committee. The question now before the house is the acceptance of the report of the committee.

(It was moved and seconded that the report of the committee be adopted, the question was taken, and the motion was agreed to.)

SUPPLEMENTARY REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES IN RELATION TO REGULATION NO. 2 FOR LIQUID-MEASURING DEVICES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN

Your committee on specifications and tolerances, finding that there was considerable objection on the part of many manufacturers of meter systems to the final adoption of the second paragraph of Regulation No. 2 in relation to air-release devices on meter systems, have held a meeting at which the protesting manufacturers were heard. At that meeting arguments which seemed to your committee to have merit were advanced, and it was especially emphasized that the proposed conference regulation would be in conflict with the Underwriters' requirements. It was also felt by the manufacturers that the final adoption of the regulation at this time would be unfair to many of them who had not yet been able to develop effective units of the character in question.

In view of the fact that it appears to your committee that the whole matter is of such importance as to warrant further consideration, and in view of the further fact that it is believed that in the meantime the matter can be successfully handled by strictly adhering to the conference tolerances in accepting or rejecting metering systems, your committee now recommends that the adoption of the second paragraph of the regulation in question be considered as tentative only, and that the whole subject be reviewed by the next conference in the light of data collected in the meantime.

Respectfully submitted.

(Signed) F. S. HOLBROOK, *Chairman*,
I. L. MILLER,
JOSEPH G. ROGERS,
W. A. PAYNE,
Committee on Specifications and Tolerances.

(It was moved and seconded that the report of the committee be adopted, the question was taken, and the motion was agreed to.)

FACTORS INVOLVED IN LARGE-CAPACITY WEIGHING

By M. J. J. HARRISON, *General Scale Inspector, Pennsylvania Railroad*

I have been asked to appear before you to-day for the purpose of discussing the subject, Factors Involved in Large-Capacity Weighing, and it has been suggested to me that I might specifically discuss variations between origin and destination weights of carload shipments, especially of coal. The basis for this suggestion appears to have been that retail coal dealers often call on their local weights and measures officers for advice in connection with this subject, and it is represented to me that, due possibly to changes in per-

Digitized by Google

sonnel, those local weights and measures officers are in some cases not sufficiently well posted on this particular subject to be of material assistance. This checks with my personal experience at State weights and measures meetings, where I have frequently been sought out by one or more of the members in attendance and asked for specific information regarding some phase or other of the general subject of carload weighing.

Before going further with my remarks, I wish it to be clearly understood that I do not appear before you on behalf of the railroads in general or of any specific railroad. I would further say for the purposes of the record that much of the familiarity that I have with my subject is due to my work on a committee set up to investigate the technical side of this question, to which committee I was appointed during March, 1930, as the representative of the American Railway Engineering Association.

As I see the situation which might confront a local weights and measures officer, it would be about as follows: A retail coal dealer has been buying his season's supply of coal in carload lots, and has been paying for it on the basis of shipping weights—the usual trade custom. He has sold this same coal in relatively small lots over his wagon or motor-truck scale until, at the end of the season, he finds either that his yard is cleaned up or that he has practically the same amount of coal on hand as he had the last time he made a check. The dealer takes this opportunity to balance his total sales against his total receipts, and he finds that one of three things has apparently happened. First, he may apparently have come out about even; second, he may apparently have sold more coal than he received; or, third, he may apparently have received more coal than he sold. In the first case there would be no particular point in taking the matter up with the weights and measures officer, and we may therefore assume that the weights and measures officer would not hear of this situation. Still less can I imagine a coal retailer admitting to his local weights and measures officer that he has sold more coal than he received. Therefore we see that the only time the weights and measures officer would hear of the coal dealer's troubles along this line would be when the coal dealer apparently wound up his season with a shortage. It is then that the weights and measures officer may be consulted and, if that weights and measures officer is well posted on the matter, it is possible that he will be of real assistance to everybody concerned.

Obviously, the first thing to be considered is the accuracy of the coal dealer's wagon or motor-truck scale. Of course, if the wagon or motor-truck scale is found to be incorrect, that may be the answer to the whole question. If, however, the scale over which the coal was retailed is in satisfactory weighing condition, and it is known that it has been in that satisfactory condition during all of the time involved, then something else must be looked for. Incidentally, it is necessary to point out to the coal dealer at this time that his wagon or motor-truck scale weights do not necessarily constitute a satisfactory check against track-scale weights. This is a principle which has been so universally accepted that I do not feel like taking up the time of this conference to demonstrate its basic truth. I would, however, like to mention two States which, to my knowledge, by

Digitized by Google

specific act of legislature or assembly, have established tolerances on retail deliveries of coal. The States are New York and Pennsylvania, and their respective tolerances are 30 pounds per ton (or 1½ per cent) (New York laws, 1922, ch. 48, art. 18, p. 172, sec. 222) and 40 pounds per ton (or approximately 2 per cent) (Penn. Stats., 1920, p. 2089, sec. 21599). If a dealer were consistently to send out loads of coal which varied from true weight by these amounts, it obviously would not be long until the total difference was considerable.

The next thing to be considered is the amount of the dealer's apparent shortage, and it would be well to express this in one of three ways—in pounds per car, in pounds per ton, or in per cent. When this is done, it frequently happens that the resulting figure is so small that the coal dealer immediately realizes that it is negligible, and sees that he has little if any complaint.

It is assumed that, as a matter of good business, the coal dealer has questioned the weight of any car delivered to him where there has been an indication of loss of lading en route. Cases of this kind, where for instance there is a marked depression in the surface of the load, should be taken up with the delivering railroad before any part of the lading is removed from the car.

It is further assumed, also as a matter of good business, that any cases of obvious error in billing have similarly been taken up with the delivering railroad. In this category would fall such cases as, for example, billing prepared for a 70-ton car when, as a matter of fact, the car received by the coal dealer was of only 50-ton capacity.

It is still further assumed that all concerned are satisfied that there have been no thefts from the dealer's yard during the period covered by his check.

These points are mentioned here chiefly as reminders to the weights and measures officer.

If the procedure above indicated is followed, and the coal dealer is still of the opinion that somebody owes him something, then about the only thing left for the weights and measures officer to suggest is that the coal dealer order a car reweighed by the railroad. This service will be performed by the railroad at its nearest convenient weighing point, but there will naturally be a delay in the final delivery of the car. Furthermore, the coal dealer will learn, if he does not already know it, that he may have to pay for this additional service in accordance with the provisions of the railroad company's tariff. It is not within the purview of this discussion to consider the individual tariffs of all the railroads in the United States. However, since almost all of our railroads have embodied in their tariffs the National Code of Rules Governing the Weighing and Reweighing of Carload Freight, specific mention should be made here of those rules.

Briefly, the National Code of Weighing Rules is a set of rules worked out in joint sessions of the weighing committees of the National Industrial Traffic League and the American Railway Association, and approved and adopted by those organizations in May, 1914. Each of the meetings and hearings which led to the formulation of the rules was also attended by an official representative of the Interstate Commerce Commission. The rules were later indorsed

Digitized by Google

by the Interstate Commerce Commission, and the following statement was issued over the signature of the secretary of the commission on June 9, 1914:

> The American Railway Association has adopted the code of rules governing the weighing and reweighing of carload freight reported by its weighing committee, and recommends that it be made generally applicable on interstate traffic. These rules have been considered and approved by the National Industrial Traffic League. The Interstate Commerce Commission, recognizing the great benefits to be derived from uniformity in weighing and reweighing rules, is desirous of lending its influence to the movement. The commission therefore indorses the rules governing the weighing and reweighing of carload freight adopted by the American Railway Association, and recommends that they be made effective on interstate transportation throughout the country.
>
> This action of course is subject to the right and duty of the commission to inquire into the legality or reasonableness of any rule or rules which may be made the subject of complaint.

Pursuant to the above recommendation, and with the encouragement of both the American Railway Association and the National Industrial Traffic League, general adoption of these rules and publication thereof in the tariffs of the railroads of the United States have followed.

The rules contemplate, first, that the charges for transporting freight will be based on the weight obtained at or near point of origin of the shipment. This principle has been approved by the Interstate Commerce Commission (28 I. C. C. 7), and the commission has further indicated that coal should be weighed on track scales located not more than 50 miles from the mine (Opinion 2399). The rules then provide that this point-of-origin weight shall not be set aside as a basis for determining transportation charges except in case of obvious error or unless subsequent weighing discloses a difference in excess of a certain amount. In the case of coal shipments, this amount or tolerance is variously stated in existing tariffs as 1 per cent or 1½ per cent of the weight of the lading, with appropriate minimum. The rules further provide that a stipulated charge will be made for reweighing at the request of consignors or consignees, but go on to say that, if the reweighing discloses a difference in excess of the tolerance between the reweight and the point-of-origin weight, the reweighing charge will be canceled.

Then, in so far as our illustrative coal dealer is concerned, he will find that he will be charged by the railroad for the reweighing of all cars where the difference between the reweight and the original weight does not exceed the tariff tolerance. As to cars where the reweighing does not check the original weight within the tariff tolerance, he will not be charged for the reweighing service.

At this point I want to digress just a little and mention a situation that has sprung up in comparatively recent years. I refer to the formation throughout the country of numerous associations of retail coal dealers, operating under a variety of names—some as traffic associations, some as traffic advisory bureaus, some as service bureaus, etc. Now, I do not want to be understood as belittling in any way the accomplishments of legitimately organized cooperative effort, and I want to say definitely that I believe that some of these associations have been of invaluable service to their members. At the same time, I would remind you that an association of the sort I am talking about is all too frequently organized by some hustling young man for no

Digitized by Google

better reason than to make a job for himself. It follows, in such cases, that the policies of the association are very largely those of its organizer, whom we now find with the title of executive secretary, or the equivalent, of the organization. Now, it is a fact that some of these gentlemen have definitely and consistently recommended to the members of their organizations the reweighing of all cars of coal received by them. As a hard and fast policy this is, to say the least, very questionable from the standpoint of net value to the consignee. He will have to pay reweighing charges on a certain number of cars, and while, of the remainder, he may be successful in getting his freight bills reduced on some cars, he certainly is apt to have his freight bills increased on others. The net result is more than likely to be that the individual member is out of pocket before he gets through, and this has been found to be exactly the case by two large concerns of which I happen to know. Both of these concerns are receivers of coal in carloads in large quantities. Both concerns consistently reweighed all the coal that they received for a substantial period of time, and both of them found that it did not pay. Consequently, as a matter of sound business judgment, both concerns stopped paying out money for something that was doing them no good, and confined their reweighing orders to those few cars where there was ground for suspecting that part of the lading had been lost en route, or where there was evidence of error in the preparation of the billing.

The recital of the situation just mentioned may appear somewhat extraneous in this discussion, but it has resulted in another situation which is intimately a part of the general problem. What has happened is this. The executive secretary has, as stated, recommended general reweighing of coal to his members. The members have gone ahead in line with that recommendation, and found that it was costing them money. Naturally enough, they have told their executive secretary about it, and possibly criticized him for leading them astray. The executive secretary takes stock of the situation, and sees that if his members did not have to pay so many reweighing charges they would stand a better chance of coming out ahead of the game. Then it occurs to him that the size of the tolerance allowance is what determines whether his individual member is or is not charged for the reweighing service. This leads to the rather brilliant conclusion that if he can contrive in some way to get the tolerence allowance reduced, there will be fewer reweighing charges to be paid and he will be in the good graces of his members again, without having had to admit that his original recommendation was unsound. So up before the Interstate Commerce Commission bobs our executive secretary with a formal complaint to the effect that the tolerance rule, in so far as it applies to his members, is unjust or unreasonable or discriminatory, and the argument is on.

In the most recent case of this kind that I have noted as coming before the commission the complainants have, strangely enough, apparently relied primarily on the reports of the National Bureau of Standards to support their contention. They have argued that the National Code of Weighing Rules was set up in 1914, which is uncontested. They have argued that there has been a great improvement in the mechanical accuracy of track scales in the 17 years that

Digitized by Google

have elapsed since that time, a fact which, far from being contested, is regarded with more or less pardonable pride by owners of track scales generally, and it seems appropriate at this point to mention that considerably more than half of the track scales in the United States are owned by other than railroads. The complainants have then argued that this improvement in the mechanical accuracy of track scales should be reflected in a drastic reduction in the value of the reweighing tolerances.

The defendants' answer to this argument has been, in effect, that the original tolerance figures applying to differences in indicated weights were never set up on the assumption that shipments would be weighed on incorrect scales (a fact which I personally find easy to believe), and that the facts that the National Bureau of Standards has tested a certain number of track scales in each fiscal year since 1914, and has found, generally speaking, an increasingly large percentage of the scales tested each year to be within its tolerance under test conditions, have nothing whatever to do with the case. The defendants have further argued that the factors which are of the most importance in their effect on the accuracy of a given weight determination are outside of human control, and are entirely separate and apart from mechanical accuracy of track scales. These additional factors will be summarized a little later herein.

Just as a side light, in the case before the commission to which I just referred, complainants asked specifically for a tolerance rule which would operate in this way. When a car was reweighed at destination, and the destination weight was less than the original weight, then the destination weight would be used as the basis for freight charges. If, however, the destination weight was greater than the original weight, then that destination weight would be disregarded and forgotten. A sort of "heads-I-win, tails-you-lose" proposition. This is mentioned here merely to illustrate the attitude of some of these executive secretaries of whom I have spoken.

And now, to get back to my statement to the effect that, when certain things had been done, the local weights and measures officer could do nothing further than suggest that our hypothetical coal dealer order a car reweighed. I would especially caution the weights and measures officer against recommending or even suggesting that the coal dealer order all of his cars reweighed. Should this course be taken by the coal dealer, not only would his cars be delayed, but I am satisfied that his experience would be essentially the same as that of other parties mentioned herein, and that he would find that he was losing money.

Let us consider now the factors which the tolerance allowance of 1 per cent or 1½ per cent covers. Coal, as you all know, is generally exposed to the weather while in transit because of being shipped in open-top cars. This type of equipment is, of course, practically demanded by the coal trade from considerations of business economics. At the same time, the very fact that the coal is exposed to the weather means that it both absorbs and loses moisture while en route, and the moisture contained in the load is obviously always weighed with it. For this reason, the indicated weight of a carload of coal will vary directly with the amount of moisture present in the load. It is perfectly obvious that a load of coal exposed to rain or snow will

Digitized by Google

soak up moisture, and therefore gain in weight. It is well known that coal will dry out and lose moisture, and therefore weight, when exposed to dry air. What is not so well known is that coal will absorb atmospheric moisture, and therefore gain weight, when it is relatively dry and is exposed to moist air.

I will cite two examples which will tend to show how large the variations in weight due to absorption and loss of moisture may be.

In the first example, 50 newly built cars were loaded with coal and weighed. The loaded cars were then hauled back and forth over the railroad on which they were loaded a total distance of 834 miles, and on the eleventh day after the original weighing they were reweighed on the same scale. During the 11 days, as nearly as could be determined, a total of 1.23 inches of rain fell, about 1 inch of which fell on the seventh day of the period; clear weather prevailed during the last four days of the period; 1.23 inches of water in an area equal to the top opening of the cars used in this test would add more than 2,400 pounds to the weight of each car. However, when the cars were reweighed, it was found that the increase in weight varied from 500 to 1,700 pounds per car, with an average increase per car of 1,254 pounds.

Another lot of cars, this time 10 in number, had passed through a rather heavy rain between the mine and the track scale. The amount of rain falling on these cars is, unfortunately, not a matter of record. These 10 cars were placed in a closed building immediately after having been weighed and stored there for 10 days. At the end of this period water was still dripping from the bottom of the cars, and reweighing showed that some of the cars had lost as much as 3,500 pounds, all of which was necessarily the weight of the water that had run out at the bottom of the cars and evaporated from the surface of the coal.

In addition to variations due to the causes just referred to, it must be kept in mind that the operation of weighing cars in a busy railroad yard is not, nor can it be made a precision operation. I do not mean to infer that weighing is slighted or carelessly performed. It just simply is not a laboratory operation and, furthermore, there is no practicable way of knowing how nearly the indicated weight of a carload shipment agrees with the real weight. The problem is to say what constitutes commercially practical agreement between one indicated weight at point of origin and another indicated weight at destination. And even between "correct" scales, the maximum apparent variation in net weight of the general average carload of American freight may be as much as 0.82 per cent of such net weight. (The term "correct" as used here means "within tolerance under specified test conditions.") This, again, is cited to give you an indication of the values which must be anticipated.

I have previously mentioned that the tariff tolerances applying to differences between two weights of the same car do not exceed 1½ per cent. When this value is considered in comparison with the difference that may occur between two "correct" scales (0.82 per cent) and the variations due to absorption and emission of moisture, which can in no way be humanly controlled, and when it is further considered that no attention has thus far been given to such sources of variation as the zero-load balance of the scale, the balance of the

Digitized by Google

scale when the car is being weighed, the personal equation of the weigher, the pressure of the wind on the car, and all other matters which are encountered under practical operating conditions, it becomes obvious that the figures 1 per cent and 1½ per cent must have been compromise figures, as indeed they were. That they have worked so well in practice is a tribute to the sagacity and prudence of those gentlemen who evolved them in 1914, and it would be highly unfortunate if they were upset by some ill-considered agitation from purely selfish motives, when they have been demonstrated to be so satisfactory in the vast majority of cases.

THE ITINERANT SCALE MECHANIC

By DEFOREST MCLIN, *Sealer of Weights and Measures, Huntington County, Ind.*

Mr. President and gentlemen of the conference, the purpose for which you and I labor in our calling is to give service to the merchant and to the public, to aid and assist both the seller and the buyer in arriving at a correct measure, to reduce fraud to a minimum, and, if possible, to eradicate it, in short, our mission is to make fair dealing the basis of every transaction involving either weight or measure.

In order that we may accomplish our aims, the instruments of the merchant must be in good condition at all times. One of the greatest obstacles in the path of a city or county sealer, is the scale mechanic who goes from place to place, always tinkering with the very instruments we want and must keep correct, but seldom, if ever correcting even the slightest of faults.

Until other arrangements are made, there is need of the itinerant scale mechanic in the more or less isolated communities, where there are no scale-repair shops maintained and supported by interested scale manufacturers, or individuals, who have chosen this work as their vocation.

To those mechanics who serve the users of scales in an honorable way, and through whose efforts a needed service is established and maintained in the commercial field, it is desired to give worthy praise.

But the man who misrepresents himself as a scale mechanic by carrying with him a few short-test weights and who is a genius in the art of deception, and who is void of any semblance of a conscience, has no place in our economic plan. This paper is intended to aid in stopping the practices of this type of man. Such a man is a menace to the community, the scale industry, and the department of weights and measures, all of whom he chooses to prey upon, for the sole purpose of furthering his own selfish ends.

The itinerant mechanics, as far as I have been able to ascertain from those met with, have had the compulsory training given by scale firms to new salesmen, to enable them to intelligently demonstrate scales and make minor adjustments; or they are men who have been formerly employed by scale companies in factories or repair centers. They may have had some training in setting up new scales, or repairing old ones. They at least, have had the opportunity to observe men skilled in their trade. These men start out, calling themselves scale experts, to defraud an unsuspecting public. Through necessity and

Digitized by Google

contact with other repairmen they develop their unscrupulous methods.

Often these men introduce themselves as scale inspectors, gain the confidence of the scale owner, and are then permitted to test the scale. Through the use of test weights that are not correct he soon convinces the owner that he is short weighing the public. If the owner of the scale refuses to let him make repairs, he then tells him he has to make a report to the sealer, which will mean that his scale will be condemned. Oftentimes this argument or method of intimidation convinces the merchant, who tells him to proceed with the necessary repairs. There being no necessary repairs, the scale receives a partial cleaning and is put back together. The mechanic collects for his unnecessary services and seeks another victim. Other methods employed by these mechanics to show defects in computing scales are: Hampering the scale's action by impeding the freedom of the rack, throwing the scale out of level, tightening the thrust bearings, placing small articles between the knife-edges and their bearings, and adding weight to the pendulum, or to the platter. Any one of these petty tricks is sufficient to cause the scale to be become inaccurate. Through these practices they gain permission to repair the scale.

To further his cause, after he gets the scale torn down, the "mechanic" shows the owner the need of new parts, such as springs and bearings. These he replaces at extremely high prices and by the time the repairing is completed, the cost is greater than it would have been, had the scale been sent in to the manufacturer and completely overhauled, assuming the scale needed mechanical attention in the first place.

Employing the above methods and a confederate, these so-called mechanics are not only in the scale-repair business, but have gone into the rebuilt-scale business also.

After gaining permission to work on the scale, the repairman explains that it is necessary to take the scale to his repair shop, as it needs extensive repairs. He has in his car a rebuilt and refinished scale, which he sets up for the merchant to use, until he returns the repaired scale, but before leaving, makes the owner an offer to sell the set-in scale for a substantial sum and the merchant's scale. He then instructs the merchant to call the sealer and have the scale tested. In this way he can take out a mechanically correct scale, and set his in and be gone when the sealer arrives. Of course the sealer finds the scale correct and it is sealed.

The itinerant's confederate in the next few days, places a new scale on the counter, and offers to take the scale set in by his partner, at a valuation much higher than it was offered to the merchant, thus inflating the value of the worked-over scale. The merchant is inveigled into this scheme, and upon the return of the repairman, the merchant trades scales, paying the difference. He now has a scale 15 years old, while the one he lost he had purchased new a few years ago.

The confederate to-day is able to procure new charts and other parts, which he uses to recondition scales, repairing types that are obsolete, and which have been condemned by the specifications of the State department years ago.

Digitized by Google

Itinerant scale repairmen of the type under discussion show utter disregard in defrauding innocent people, by misrepresenting themselves, and by infringing on the good name built by reputable manufacturers. They are a menace to the scale industry and to the users of both small and heavy-duty scales as well.

Methods commonly used to show needed repairs on heavy-duty scales are: To add weight to the poise, to obtain a correct balance and then lighten the hanging weights, to tighten or loosen the turnbuckle on the beam rod, or to impede this rod's action by some other method. All of these tricks are perpetrated on the scale owner, oftentimes in his very presence, for the sole purpose of either gaining permission to repair the scale, or gaining admittance to the scale pit. Once having gained admittance to the scale pit, the mechanic is able to move the nose irons and pin pivots in their shackles, in some truck types to shorten or lengthen the saddle bolts in the main levers, or to loosen the extension levers.

After any of these false adjustments mentioned are made, the scale is easily proven inaccurate and oftentimes this is confirmed by the sealer. Thus gaining permission to repair the scale, it is torn out and the knife-edges reground and reinstalled. In this manner the mechanic covers up his methods of deception by removing the trick causes of inaccuracy.

The itinerant seldom sees to it that the pit is properly cleaned and would rather cause a drain to be clogged up than to be free. The condition of the weighbridge and the end sills are never checked. In his mania to grind a knife-edge, cut and defaced bearing surfaces are seldom if ever reground. Here he often neglects a very serious defect, that causes great loss to the scale owner, and usually the itinerant leaves a scale in worse condition than he found it.

These men often repaint parts of the scale, then resell them to the original owner as new replacement parts, in this manner collecting greater fees.

An itinerant, after working on a 6-ton loose-weight scale, told the owner he could make the scale a 12-ton auto-truck scale by selling him a secondhand 12-ton weighbeam. Again preying on the ignorance of the scale owner, this man at the same place impeded the action of a portable scale by placing a wooden block under one of the bearing plates.

The itinerant not only passes himself off as an inspector of weights and measures, but as a special representative of the various scale firms. Going to the extent of making a survey of a selected territory and noting the different makes of scales, they return appearing in "cover alls" with the scale firm's name woven in the garment. The impostor in this way has greater opportunity to defraud and ruin established reputations of reliable scale firms.

Apparently no job is too big or too small for the unscrupulous itinerant scale repairmen. A small even-arm balance, repaired by one of these itinerants, was found upon examination to have had one of its bearings replaced. This bearing was prepared from a ½-inch die, of the type usually found in crap games, by filing a crude rectangular groove in one side. The die was then placed in a very

Digitized by Google

poorly constructed tin holder which was in turn crudely soldered to the scale frame. The merchant, satisfied for the time being at least, paid the bill and the repairman went happily on his way to find another victim.

The inspector of weights and measures may unconsciously become a confederate of the unscrupulous scale mechanic. He may be called by the repairman to test the scale, with which he has tampered, in order to have his statements as to the scale confirmed. Generally, however, the itinerant endeavors to avoid the inspector of weights and measures. Instances are reported in which scale owners have refused to pay repair bills until the repairs were pronounced satisfactory by the inspector of weights and measures and the scale sealed. In these cases the itinerant never returns for his money.

As already stated, the scale-repair mechanic holds an important position in our present plan of organization. The scale owner is furnished an invaluable service by the honest mechanic who can examine the scale, diagnose its trouble, and make such repairs as can be made in the field. Such a mechanic can furnish further valuable service if he has a shop in which major repairs can be made at reasonable cost, or who can advise the scale owner how and where he can obtain such service at reasonable prices. The unscrupulous mechanic, however, must be eliminated if scale manufacturers, scale owners, weights and measures departments, and the public are to be fully protected from his nefarious practices. Two plans for obtaining this end suggest themselves—education and legislation. Scale manufacturers can do much in educating scale owners and scale users by instructing them in the proper installation and care of scales and by furnishing efficient service at reasonable cost.

Weights and measures departments and sealers can do much to eliminate the itinerant repairman by acquainting the owners and users of scales with his methods and the damage to the scales and the financial loss that may result. The unscrupulous repairman fears publicity. A few stories of his work in a public press will go far in curtailing his activities.

It is the belief commonly expressed that too many laws already encumber the statute books. Perhaps this may be so. It would seem, however, that a law reasonably regulating the activities of scale-repair mechanics would place no hardship upon honest mechanics but would give needed protection both to them and to all those interested in the maintenance of scales in good repair. Such a law might require the licensing and bonding of scale mechanics after some authorized authority has passed upon their qualifications. Existing weights and measures laws might be amended to require the mechanic to obtain a permit from the State commissioner of weights and measures upon satisfying the commissioner that he is qualified to perform the duties of an expert scale mechanic, and that he is a man morally who will render honest service.

Until satisfactory legislation can be obtained, education must be depended upon to free the scale industry and those who use scales from the parasite that has so long preyed upon them.

Digitized by Google

DISCUSSION OF ABOVE PAPER

Mr. FOSSETT. In the State of Illinois we tried to get some legislation through in regard to the bonding of scale repairmen, but we did not have any success at all in having it brought up.

NET-CONTENT MARKING OF PACKAGES UNDER FEDERAL FOOD AND DRUGS ACT

By W. S. FRISBIE, *Principal Chemist, Food and Drug Administration, United States Department of Agriculture*

Mr. President and members of the conference, first of all I want to say that the Food and Drug Administration appreciates the opportunity accorded it in presenting briefly our operations under the net-weight amendment because of the fact that we appreciate it is somewhat apart from the work of weights and measures officials who are charged with the standardization of measures and weights. I have attempted to set forth briefly our requirements here, but we do not include all of them. Consequently, if, when I have finished, you have some questions, I will be glad to attempt an answer.

The Federal food and drugs act—signed by President Roosevelt exactly 25 years ago on June 30—in spite of its valuable provisions for public health and financial well being, contained no provision to regulate a most fruitful source of deception. I refer to the absence in the original statute of a clause requiring a statement of quantity of contents on packaged food.

The act, drawn up by the late Dr. Harvey W. Wiley and introduced by Senator Weldon B. Heyburn, of Idaho, was literally forced into enactment by public demand and was passed in spite of the ardent protests of influential members of the food and drug manufacturing trades. A number of recurrent attempts at food and drug regulation in several States had built up in the public mind the realization that unethical, if not downright dangerous, practices on the part of the trade demanded a Federal law. The same period made it possible for unscrupulous business interests to create in Washington one of the most powerful lobbies that ever fought the passage of a law designed to protect the public interest.

The food and drugs act became effective January 1, 1907. It committed the execution of the law to the Bureau of Chemistry of the Department of Argiculture and defined in specific terms the duties of the bureau and of the Secretary of Agriculture with regard to its enforcement. Briefly, it required the Bureau of Chemistry to examine all samples of foods and drugs for the purpose of determining whether they were adulterated or misbranded and it required the Secretary of Agriculture to grant hearings to parties accused of adulterating or misbranding, in order to determine whether the methods of the bureau were in error. The findings of the bureau were to be transmitted to the Department of Justice for judicial action. This procedure is still followed to-day.

The act is intended to be an economic as well as a public health measure. As an economic measure, it protects the honest producer from unfair competition and insures to the consumer a product that

Digitized by Google

conforms to the statements on its label. As a health measure, it prohibits added poisonous or deleterious ingredients in the case of domestic foods and authorizes the exclusion from importation of foods that may be dangerous to the health of the people of the United States. The law applies to interstate and foreign commerce in all foods and drugs and to imported food and drug products.

It will be noted, then, that the law as originally enacted contained no provision as to statements of net weight or quantity of contents on the labels of packaged food, in spite of the fact that many of the State laws already in force and those enacted in the year 1907 contained such provision. This omission was corrected March 3, 1913, when the so-called net weight act was passed. Briefly stated, this amendment requires that all food in package form shipped in interstate commerce shall be plainly and conspicuously marked to show the quantity of the contents in terms of weight, measure, or of numerical count. The amendment itself was amended by a clause in an appropriation act of July 24, 1919, bringing wrapped meats, such as hams, sides of bacon, and similar meat products, within its provisions. The equitable enforcement of the net-weight amendment requires allowances for reasonable variations and tolerances as well as exemptions for small packages. These tolerances are issued as regulations signed by the three Secretaries—Agriculture, Commerce, and Treasury.

The pertinent provisions with respect to the tolerances under the net-weight amendment are set forth in regulation 26 of the Service and Regulatory Announcements of the Food and Drug Administration which was created by act of Congress in 1927 to carry on the work originally committed to the Bureau of Chemistry. This regulation declares in part that statements shall be made plainly and conspicuously on the outside of the container and that such statements shall not be obscured by legends or designs and shall be clearly legible when viewed, with due consideration to the ordinary circumstances under which it is observed by the prospective purchaser. All statements of content are to be made in terms of the largest unit of the package, unless there is a definite trade custom otherwise. Weight statements are to be made in terms of avoirdupois pounds and ounces; statements of liquid measure in terms of the United States gallon of 231 cubic inches and its customary subdivisions, quarts, pints, and fluid ounces; and statements of dry measure in terms of the United States standard bushel of 2,150.42 cubic inches and its customary subdivisions. There is a further stipulation that articles in barrels may be labeled as to quantity of contents in terms of the United States standard barrel, as fixed by the act of March 4, 1915, which makes the lawful subdivisions as third, half, and three-quarters of a barrel. There is a further proviso that quantity of contents may be declared on the appropriate metric terms. Solids are to be stated in terms of weight and liquids in terms of measure. Viscous or semisolid food may be stated either by weight or measure but the declaration shall inform the consumer as to which basis is employed. In other words, a declaration of 12 ounces avoirdupois, or 12 fluid ounces as the case may be, instead of the ambiguous term, 12 ounces. If a definite consumer acceptance exists as to quantity

Digitized by Google

of contents in viscous or semisolid foods, the statement shall be made in accordance with such understanding.

Statements of numerical count are permitted only when such statements give accurate or definite information as to quantity of contents in the package; otherwise a weight or measure statement is required.

Tolerances provided in the regulation are general and not specific and they include—

(1) A recognition of the discrepancies which are due exclusively to errors in weighing, measuring, or counting, conducted in accordance with good commercial practice;

(2) Discrepancies which are due exclusively to differences in capacity of bottles which can not be obviated on account of difficulty of manufacturing; and

(3) Discrepancies in weight or measure due exclusively to variations in atmospheric conditions, particularly with respect to moisture.

The first two discrepancies—that is, errors in weight and variations in containers—shall be as often above as below the marked quantity and the reasonableness of discrepancies due to atmospheric conditions must be determined in each individual instance. The exemptions as to net weight markings are packages containing one-half avoirdupois ounce of food or less and packages containing 1 fluid ounce of food or less, and, in the case of count goods, six units or less, unless such package otherwise is required to bear a weight or measure statement.

In spite of the opposition attendant upon the passage of the food and drugs act originally, the department experienced a rather prompt acceptance on the part of the manufacturing industry to comply with the provisions of the net-weight amendment, so much so that only infrequently was it necessary to apply measures to enforce a recognition of these provisions. This situation has prevailed to the present. Lately, however, there is observed a tendency in certain sections of the trade to ignore not only the spirit but the letter of the law which requires a plain and conspicuous statement of quantity of contents. It is extremely rare to find an instance where net-weight statement does not appear on food in package form but not at all unusual to find the statement as to quantity of contents either in faintly legible or small type, not always on the main label, and all too frequently obscured by legends or pictorial designs. In many instances the statement as to net weight is illegible due to a lack of contrasting background. These statements are not to be accepted as an indictment in general terms of the food-manufacturing industry or even of certain industries. The Food and Drug Administration does not believe that these inconspicuous or obscure statements as to net weight are a result of conscious deliberation on the part of the manufacturer but due more likely to carelessness or to a consideration first of all of the arrangement of a label which shall be attractive to the purchaser. The intent of the law, however, is plain and it means that the prospective purchaser shall be enabled readily and understandingly to select food in package form with an accurate knowledge of the quantity in the package. The administration is at the present time considering the advisability of making a public announcement to the manufacturing industry calling attention to the requirement of the act for a plain and informative statement as to quantity of contents in all food in package form.

Digitized by Google

There is another tendency which has been observed which, while not illegal so far as the Federal food and drugs act is concerned, nevertheless may in some instances contribute to a deception of the purchaser unless he continually obeys the injunction to read and read carefully the label. I refer now to a practice of marketing certain articles of food in what is presumably a standard-size container, 1 pound, for example, but containing actually, and so labeled, 14 or 15 avoirdupois ounces. Similar departures to the same degree are also noted in packages of other so-called standard sizes. For example, a carton of butter containing 14½ or 15 ounces would ordinarily be purchased as a pound carton. That such a practice tends to deceive has been recognized in at least one instance in a State where legislation requires that all cartons of butter shall contain 16 avoirdupois ounces. There is also a tendency on the part of some manufacturers to market liquid commodities in terms of weight, contending that such is a recognized trade practice. While we know that olive oil, for example, is sold in bulk to bottlers on a pound basis, there is ample evidence that the consumer thinks of the olive oil in terms of liquid measure, and consequently a statement on a package of olive oil such as "one-half pound" will not be as informative as its equivalent in terms of quarts or pints. An analogous situation exists in the marketing of sirup. A can of sirup, for example, containing exactly 10 pounds avoirdupois looks like a gallon of sirup and is frequently offered, particularly in the retail markets, by advertisements or otherwise, as a gallon of sirup, when in fact a gallon should contain 11 pounds.

There is at least one other practice which, although by no means general, deserves attention. I refer now to understatement as to quantity of contents. Our attention has been called to understatements on certain commodities, the most conspicuous example of which appears to be in the labeling of bread. A loaf of bread weighing 22 to 23 ounces may bear a label, "Not less than 18 ounces." There would perhaps be no objection on the part of the consumer to being supplied with more food than he expected but it is often a fact that there is another factor involved. There are a number of the States which have enacted so-called standard weight bread laws, specifying usually loaves of 1 pound or 1½ pounds, or even multiples thereof. It is obvious that if a loaf of bread weighing 22 to 23 ounces would compare favorably in size with the standard 24-ounce loaf, it might undersell that loaf and evade the intent of the legislature by an understatement as to quantity of contents if not constituting actually an illegal size loaf.

There is another amendment to the food and drugs act, the most recent one, signed July, 1930, which is of interest to weights and measures officials. This is known as the Mapes amendment or, as it is sometimes termed, "the canners' bill." By the terms of this amendment the Secretary of Agriculture is authorized to declare standards of quality, condition, and fill of container for all canned goods, excepting canned milk and canned meat and meat products. The purpose of the amendment is to segregate canned food into a standard class and a substandard class. The department is empowered to determine which of these commodities fall into the substandard class, which, although still legal under the terms of the act, must bear a special label showing the purchaser that they are classed as substandard. Under the proviso as to fill of container, the Secretary of Agriculture,

Digitized by Google

on February 16, 1931, announced the position of the department as to the fill of container for all such commodities in the following words: "Canned foods shall be considered as of standard fill if the entire contents occupy 90 per cent or more of the volume of the closed container." While this decision regulates the head space in the cans the general terms of the act take care of the liquid or vehicle in which the fruit or vegetables or other commodities are packed.

We may perhaps be justified in conclusion in attempting to prophesy what may be the future legislation so far as net-weight amendment is concerned. We have seen in the Federal food and drugs act a development from the statute which originally made no requirements whatever as to statement of the quantity of contents to the present time when the most recent amendment authorizes the Secretary of Agriculture to make a requirement as to how much of the package shall be filled regardless of the statement of quantity of contents on the label. A forerunner of this public opinion has been expressed repeatedly in a bill before Congress known as the "Slack-fill bill," which had its inception probably as the result of the practice during the war period of slack filling containers on account of the rapidly advancing cost of food. This bill when first introduced encountered active opposition on the part of the manufacturing industries. According to the department's information at the present time this has been largely withdrawn so that we may perhaps before long see enacted a statute which would make illegal not only the slack filling of any package of food but at the same time rule out of the channels of trade those containers so formed as to deceive the purchaser as to quantity of contents when reliance, as is too frequently the case with the purchasing public, is placed on the appearance of the package itself.

We may perhaps anticipate even a type of legislation embodying the principles advocated by the Department of Commerce in simplifying trade practice, particularly in eliminating superfluous sizes and units. If the size of food containers could be restricted to those representing commonly accepted units such as pints or pounds and to their common multiples or subdivisions, it would prove a boon to the purchasing public and conceivably to the manufacturer. If such legislation is ever considered it will undoubtedly emanate from the trade itself in order to be relieved of the countless unnecessary sizes of food containers entailing wide opportunities for unfair competition.

THE PRESENT STATUS OF STANDARD-WEIGHT BREAD LEGISLATION

By F. S. Holbrook, *Bureau of Standards*

In order to obtain a comprehensive viewpoint of the present status of standard-weight bread legislation it seems advisable first to review very briefly one or two of the outstanding cases decided in the past, since these have a bearing on the present status and will help us to understand the present situation.

The first of these cases that will be referred to is that of Schmidinger *v.* The City of Chicago, decided by the Supreme Court of the United States in 1913 (226 U. S. 578). This case upheld the right

Digitized by Google

of the legislature, or the municipality under legislative authority, to regulate the making and selling of bread in the exercise of the police power. It was held that local legislative authorities, and not the courts, are primarily the judges of the necessities of local situations calling for police regulation, and the courts can only interfere when such regulations arbitrarily exceed a reasonable exercise of authority. Mere inconvenience to merchants conducting a business subject to police regulations does not vitiate the exercise of the power. Finally it was decided that the ordinance of Chicago fixing standard sizes of bread loaves and prohibiting the sale of other sizes was not unconstitutional as depriving those dealing therein of their property without due process of law, or as denying them equal protection of the law, or as interfering with their liberty of contract.

This is a very broad decision and effectively disposes of constitutional objections to the regulation of the sale of bread in so far as the principles underlying the standard-weight method are concerned. In applying it to some of the more recent cases it must be borne in mind that no tolerances were specified in the original Chicago ordinance litigated. This is important since it is upon the rock of numerical tolerances contained in the laws themselves that two good standard-weight bread ships have more recently foundered.

The question of shrinkage has played an important part in some of the recent cases. But the mere fact that bread shrinks and loses in weight after it is baked is not, in and of itself, a vital factor. For the problem of shrinkage was raised on behalf of the bakers in the Schmidinger case; it was pointed out that this was not uniform and depended upon quality and size of the loaf, the atmospheric conditions, and the dryness and temperature of the place where the bread was kept. The court realized that shrinkage might make it inconvenient to bake a standard-weight loaf but disposed of this contention in the words "But inconveniences of this kind do not vitiate the exercise of legislative power."

A significant element in the case which helps to clarify decisions in following cases is the citation by the United States Supreme Court of a statement made by the Supreme Court of Illinois in its decision, to the effect that the ordinance was not intended to limit the weight of a loaf to a standard size, but was passed with a view only to prevent the sale of loaves of bread which were short in weight.

It seems that the Schmidinger case still stands unmodified; later cases in which at first glance contrary conclusions seem to have been reached can be distinguished from and fully harmonized with the reasoning in this case.

The next case which may briefly be alluded to in the development of the subject, is that of Jay Burns Baking Co. *v.* Chas. W. Bryan et al., also decided by the United States Supreme Court (264 U. S. 504). This case has already been described at some length in a former conference report. (Seventeenth National Conference Report, p. 51.) It need only be said here that the Nebraska law to which the decision referred contained a provision to the effect that loaves of bread should not be in excess of the standard weights by more than a certain allowable amount, namely, 2 ounces per pound. The court held the law unconstitutional on account of this provision. In reference to it the court said that "imposition through short

Digitized by Google

weights readily could have been dealt with in a direct and effective way," and concluded that the provision that the average weights should not exceed the maximums fixed is not necessary for the protection of purchasers against imposition and fraud by short weights and is not calculated to effect this purpose.

This case conclusively denies the power of the legislature to fix tolerances in excess for the purpose of requiring a loaf to conform to a definite standard size. There can be no question that small tolerances in excess will no longer be countenanced. Certain words in the case, however, suggest that if there were to be fixed an excess tolerance calculated solely to prevent the perpetration of fraud by the baking of such a size that it simulated the next larger size, a different decision might be reached. It is for this reason that large tolerances have been incorporated in the conference recommendations. If it shall be demonstrated by future decisions that tolerances in excess are so far legal, then no one will have cause to quarrel with the decision. For certainly there is no logical reason for excess tolerances other than the prevention of fraud upon the consumer.

In the paper, heretofore mentioned, dealing with the above decision it was strongly urged that tolerances should not be included in the law itself, but that the law, instead, should confine itself to providing power in the enforcing authority to fix tolerances. This recommendation is reiterated and emphasized at the present time.

Following the decision mentioned in which the Nebraska law was found unconstitutional, a new law was passed in that State. Numerical tolerances were again included, these conforming in size to those recommended by this conference; it was provided in this connection that these tolerances should be applicable for "12 hours after baking or delivery to retailer."

Shortly after its passage this new statute was attacked in the courts in injunction proceedings, and arguments similar to those urged against the former law were repeated in the second case. This case is known as P. F. Peterson Baking Co. et al. *v.* Arthur Weaver, Governor, et al., in the District Court of the United States for the District of Nebraska, Lincoln Division. It was decided in 1930. The new law suffered the same fate as the old; it was declared unconstitutional. It is probably of great significance that although the new excess tolerances fixed were strongly attacked, the decision did not turn on this point. Instead the court took exception to the general provisions of the law, which were believed to make the baker responsible for the weight of his loaves after they had passed out of his possession and, consequently, after he had lost all control over them. The basis of the decision may best be given by quoting the words of the court.

The statute now in question requires the average weight to be below the maximum and above the minimum weight for 12 hours after baking "or delivery to retailer." Under this statute the baker or wholesaler may have kept his loaves of bread within the legal limits of weight at all times until he has sold and delivered the loaves to a retailer, and until his possession and right of control has terminated, and yet be subject to a penalty because the loaves shrink in weight within 12 hours after the retailer has taken possession of the bread.

The evidence shows that evaporation of moisture from the loaves may, and probably will, continue after the bread is in the retailer's hands. It may be exposed in show cases, or in open racks, to drying conditions caused by modes

Digitized by Google

of heating the retailer's place of business, and it may shrink in weight from exposure to sunlight or currents of air, or from many other causes.

The danger of excessive shrinkage is greater when the bread has been shipped to dealers at some distance from the baker or wholesaler, and has already suffered some loss of weight before it reaches the retailer. The portion of the statute exposing the baker or seller of bread to liability for the payment of a fine, not because of any acts of negligence on his part, but because of the manner in which bread may be kept by the retailer to whom it has been sold, is an essentially arbitrary and unreasonable restriction upon his right to transact business, and is invalid under the provisions of the fourteenth amendment to the Constitution of the United States.

We have no recollection that an objection such as influenced the court in this case has been included in the decision of any other weights and measures case in a court of record. If this case becomes settled law then it is possible that it may be necessary for some of you to adopt a somewhat different procedure than that heretofore used. It would seem that evidence for a prosecution of a baker for short-weight bread must either be collected while the bread is still in his hands and under his control or, if the bread is weighed while in the hands of the retailer, that it must be proved that the shortage is such that it must necessarily have been in violation of law upon its delivery to the retailer. The other alternative is the prosecution of the retailer for the sale of bread not in compliance with law. While this latter method would result in proceedings against a party not primarily responsible, it would probably be almost equally effective as proceedings directly against the baker himself since retailers would not be slow to demand that bread furnished them be such as fully to protect their interests.

It is unfortunate that this case was not appealed so that the decision of a higher court upon the validity of the law could have been obtained. If the Nebraska law was unconstitutional on this ground it is difficult to understand why the original Chicago ordinance upheld in the Schmidinger case was not similarly open to objection. It seems that both enactments are on the same footing in this respect—it may even be said that the Chicago ordinance was the more drastic of the two. The latter ordinance required that the loaves be full weight until such time as the bread shall become "what is commonly known as 'stale bread,' sold as such, provided the seller shall, at the time of sale, expressly state to the buyer that the bread so sold is stale bread." The Nebraska law, as stated above, applied to the bread only through what would ordinarily be a shorter interval, "for a period of 12 hours after baking or delivery to retailer." However, an examination of the record in the Schmidinger case discloses that in this case the objection governing the decision in the Peterson case was not urged.

I have said this case was not appealed. However, the State of Nebraska did not, by this omission, desert the standard-weight principle. Rather the State legislature at its last session adopted still another standard-weight law, this time omitting from the law all numerical tolerances and providing that—

The Secretary of Agriculture shall prescribe reasonable tolerances or variations in excess, but not under the weights mentioned in the preceding section, within which all loaves shall be baked, and also the time for which said weights shall be maintained.

Digitized by Google

The record demonstrates that Nebraska is unflinchingly committed to the theory of standard-weight bread as well as to the principle of excess tolerances in carrying it into effect. If any and all tolerances in excess are unconstitutional, then the new law may fail as its predecessors have done. If, on the contrary, such excess tolerances are to be permitted as are clearly necessary to prevent the perpetration of fraud through the medium of a loaf so much in excess of its nominal weight that it appears to be a loaf of the next larger legally specified size, but which is, in reality, short of this size, then it seems that this latest law should stand up under whatever assaults may be made upon it.

The recent case in Ohio mentioned by Mr. Tinkey in his State report is known as Holsum Baking Co. *v.* Perry L. Green et al. and was decided in the District Court of the United States for the Northern District of Ohio, Western Division, October 14, 1930. As explained by Mr. Tinkey the Ohio law was found unconstitutional. This law contained the following language in relation to tolerances:

> The Secretary of Agriculture shall prescribe such rules and regulations as may be necessary to enforce the preceding section, including reasonable tolerances or variations within which all weights shall be kept: *Provided, however,* That such tolerances or variations shall not exceed 1 ounce per pound over or under the standard unit for single loaves: *Provided, however,* That tolerance permitted in the weighing of 25 or more loaves shall not exceed one-half ounce per pound.

Elsewhere it is provided, "The weights herein specified shall be construed to mean net weights 12 hours after baking."

Here we encounter tolerances in excess, or, as the court referred to them, "maximum surplus tolerances," smaller than those specified in the Nebraska law, litigated in the Burns case, cited above. It is not surprising, then, to find that the court declared this provision of the law unconstitutional. The court said in this connection:

> Practically the question is here which was raised and decided by the Supreme Court of the United States in Burns *v.* Bryan. (264 U. S. 504.)

And after quoting from that case:

> With this record before us it seems inevitable to hold that the decision * * * should be controllingly applied to the issue here.

It seems clear from the decision that only one point in the Ohio law has been held unconstitutional, namely, the tolerances in excess, and the officials of Ohio can proceed to enforce the present law in all other respects. We understand that Mr. Tinkey in his report suggested that the attorney general of Ohio had reached this same conclusion in a memorandum submitted to the State weights and measures department.

The only other case of interest in this summary is that of Webben & Zeller Baking Co. *v.* Ivy L. Miller, Commissioner of Weights and Measures, et al., now being tried in the District Court of the United States for the Southern District of Indiana, Indianapolis Division. This case, like the others, turns upon the legality of excess tolerances in connection with a standard-weight bread law, the provision of the law reading:

> The State commissioner of weights and measures shall adopt and establish by rules such reasonable tolerances or variations within which these weights

Digitized by Google

of standard loaves shall be kept: *Provided, however,* That such tolerances and variations shall not exceed 1 ounce per pound over and 1 ounce per pound under the standard unit weight.

The case has up to this date only reached the stage where the court has overruled the State's motion to dismiss the bill of complaint. Perhaps in the decision of this case some additional light will be shed upon a somewhat complex subject.

That concludes the recital of facts of interest in connection with standard-weight bread legislation. It remains, in conclusion, to apply these facts to present conference recommendations in relation to bread, to determine whether these actions should be allowed to remain in status quo or whether amendments are indicated.

The conference actions in relation to standard-weight bread are as follows:

Model bread law, and revised section on bread to be substituted for bread section formerly included in model State law on weights and measures, both adopted by the Fourteenth National Conference, 1921. The text of these actions will be found on pages 131 and 132 of the Fourteenth Conference Report.

Proposed tolerances for loaves of bread adopted by the Eighteenth Conference, 1926, the text of which will be found on page 164 of the report of that conference.

The model bread law and the bread section of the general model law fix standard weights for loaves, provide for rules and regulations for enforcement, including "reasonable variations or tolerances in excess or deficiency," exempt from the provisions of the law "stale bread" and certain baked products in small units, and make it unlawful to make or sell other sizes, providing a penalty for violation. The drafts omit all mention of numerical sizes of tolerances. They do not require weight labels on bread loaves.

Applying the principles contained in the cases cited heretofore it seems that the present recommended law is unobjectionable except, possibly, in one particular, namely, that tolerances "in excess," while not enumerated in the law, are provided for by it. As has been pointed out in the foregoing it is not entirely clear whether tolerances in excess are banned in toto or whether such tolerances will be unobjectionable if, by reason of their size, it is demonstrated that overweight, as such, is not being prohibited, but that they are included to prevent the commission of a fraud through the baking or sale of a loaf which will simulate and be mistaken for the loaf of the next larger standard size. We consider it vital for the success of a standard-weight law that excess tolerances on the second basis mentioned, be maintained. After consideration of the Burns case it was decided that the language in that case sufficiently suggested that such excess tolerances might be allowed. More recent cases do not appear to upset this conclusion.

The omission of numerical tolerances and of periods of time within which they are to apply seems to have the effect of rendering inapplicable to the proposed law, the principle laid down in the most recent Nebraska case. (Peterson *v.* Weaver, supra.) This, you will remember, was to the effect that the baker might be penalized for bread which was legal when sold by him but which thereafter, as a result of shrinkage, weighed less than the legal weight.

Digitized by Google

It would be my conclusion from the above that the present model bread law should be allowed to stand unamended. If the time ever comes when it is clearly enunciated by the courts that no excess tolerances are to be permitted, then—but not until then, in my opinion—should our recomendation be changed accordingly.

The present recommended tolerances stand on the same footing. It will be remembered that these were framed and adopted after the United States Supreme Court decision in the Burns case and naturally were intended to bring the new tolerances within the principles therein laid down. The large excess tolerances allowed are not calculated to prevent the giving of overweight but to prevent the perpetration of fraud. The provision that the bread shall be full weight "at any time up to and including the time of delivery to the retailer in respect to such bread as is sold or to be sold by a baker to such retailer for resale" with an additional allowance for actual shrinkage after that time, seems to be admirably adapted to conform with the most recent Nebraska decision. Therefore, there seems to be no present necessity indicated for a modification of our proposed tolerances.

In conclusion, it may be said that we will doubtless have additional litigation in relation to present laws in the next few years. The court decisions handed down in these cases will probably further delineate the requirements which must be fulfilled by valid legislation. However, we have no occasion to feel discouraged. Details of specific laws may have to be modified to meet constitutional objections but the decisions of the courts conclusively prove that standard-weight bread legislation is intrinsically sound and that this principle can be maintained and enforced by those jurisdictions subscribing to this policy.

DISCUSSION OF ABOVE PAPER

Mr. TINKEY. Mr. Chairman, I would like to make one little correction. The tolerances are provided in the statute instead of by regulation in Ohio.

Mr. HOLBROOK. Not under the law that was decided in the most recent case?

Mr. TINKEY. Yes.

Mr. HOLBROOK. I understand the provision was to the effect that the Secretary had the power to fix tolerances not to exceed 1 ounce per pound over or under the statutory weight.[1]

CURRENT ACTIVITIES OF NATIONAL SCALE MEN'S ASSOCIATION

By C. L. RICHARD, *Secretary, National Scale Men's Association*

If that mythical individual, Mr. Average American Citizen, were given an opportunity to attend the sessions of this conference, follow its discussions, and study the many regulatory measures adopted at past conferences, he would surely feel greatly comforted to learn of the numerous safeguards which you gentlemen have provided for the protection of his interests as a purchaser of commodities by weight and measurement. If, in his study of your activities, he were to con-

[1] The provision in question, of the Ohio law, is quoted in the above paper. (See p. 166.)

Digitized by Google

sider the various requirements stipulated for the design and performance of weighing devices, he might feel some sympathetic interest in the affairs of those whose business it is to provide weighing facilities conforming to those requirements and maintain them within requisite tolerances.

The National Scale Men's Association, an organization which forms a composite representation of the man who must so provide and so maintain the public's weighing facilities, is not in the position of desiring sympathy, but it does desire you to have an understanding of what its purposes are and of what it is doing by way of supporting and supplementing your worthy endeavors. Therefore, before informing you of what the association's current activities comprise, I will state briefly just what the organization is, whom it represents, what its objects are, and why, lately, it has taken independent action in establishing some specifications and standardization codes based upon long study of matters within its particular field of endeavor. The association is not a trade group or commercial organization. It is fundamentally a technical body composed of some 225 men who are prominently engaged in the practical work of providing adequate weighing equipment and correct weighing service in American commerce, transportation, and industry. For reasons which will be cited later the problems which have mainly engaged the attention of the association are those which relate to the weighing of materials in large lots on such installations as railroad track scales, grain-hopper scales, or other forms of large-capacity weighing machines.

The several agencies which are interested in these problems and which find the association an admirable medium for forming desirable contacts and for securing concerted action toward mutually desired ends include the National Bureau of Standards, which is the custodian and distributor of mass standards; the Department of Agriculture, which supervises the weighing of livestock at public stockyards; scale manufacturers, who produce large-capacity weighing devices; railroad operating departments that maintain freight car weighing facilities; grain exchanges or boards of trade, which superintend the weighing of grain cargoes; large industrial plants, whose operations require special weighing machinery; and weight-supervision bureaus which are maintained jointly by the carriers for investigating and adjusting differences regarding weights of freight consignments.

As a general rule, large-capacity scales, such as railroad track scales and grain-hopper scales, are employed in interstate commerce transactions which do not directly concern the general purchasing public. Partly for this reason and partly because testing of such scales requires special expensive apparatus, local weights and measures departments have generally concentrated their attention on other phases of their work. Thus such regulation and supervision as there are over large-capacity scales have been developed largely by the owners of such scales and by the various agencies directly interested. It is through the National Scale Men's Association that the interests previously named have cooperated to improve the quality of the weighing equipment and the efficiency of weighing practices.

By study, research, and investigation of every subject pertinent to the general field the association has developed and disseminated

Digitized by Google

much information useful to its members. The results of such investigations are presented at annual meetings and published in the official organ, the Scale Journal.

Three years ago the association surveyed the scope of its past endeavors and took note of the fact that certain practices in the field were not conducted along lines of uniformity and best efficiency. Moreover, existing specifications for scales did not provide for the needs of a certain class of service. Accordingly, as the only body recognized as being qualified and competent to render authoritative judgment on these matters, the association adopted a policy common to modern technical organizations and began to create its own code of standards for the guidance of the members and for the general welfare of the various agencies it represented.

The projects conceived and already completed with these objects in mind have been reported to you at the two past conferences of your group, and you were kind enough to adopt resolutions indorsing them. To review them, I may say that the first was a code of specifications for the repair of heavy-duty scales, the intent being to establish a standard of practice which should protect scale owners from the faulty workmanship performed by the casual scale-repair man operating without adequate experience or equipment. The second was a code of specifications for railroad track scales suitable for use by minor industries where the volume of traffic weighed did not justify purchase of the expensive track scale specified for railroad yard service. A third project was adoption of a standard test report form for use by various scale-testing organizations which exchange reports. Another work of standardization was preparation and formal adoption of specifications for track scale test-weight cars. Since the last report was made to this conference, the specifications for track scale test-weight cars were slightly revised to conform to certain construction requirements suggested by the car construction committees of the American Railway Association. As revised and adopted, the specifications now constitute the formal definition of what a satisfactory track scale test car should be.

An interesting item of work accomplished this past year was preparation of a report analyzing the wearing properties of lever bearings and knife-edges. This report adopted at the last meeting and published in the Scale Journal of March, 1931, forms a distinct and valuable contribution to the literature available on the subject of scale-lever design.

As regards new measures begun by the association, I may inform you that three separate projects have been assigned to committees with the expectation that their completed work will form a basis for new specifications and standards of procedure. Project No. 1 is to prepare a definition of what constitutes a proper test of a railroad-track scale. There is considerable variety of opinion on this subject and it is desirable to establish a uniform and adequate system of test which shall yield the essential information required.

Project No. 2 is to establish a code of rules for the operation and maintenance of track-scale test-weight cars. This will supplement the previously adopted standards for test-car construction and will serve as a guide for scale inspectors as regards methods of weight

Digitized by Google

control, frequency of calibration, and general details of test-car maintenance.

Project No. 3 contemplates preparation and publication of a glossary or dictionary of scale terms. Confusion and controversy resulting from misuse of terms is expected to be largely eliminated in consequence of this undertaking and a better understanding of scale terminology will certainly result.

In conclusion, you are assured that the National Scale Men's Association is directing all its activities toward the same ends which your group has in mind—the continued advancement of accuracy and efficiency in weighing and weighing equipment. The association appreciates the interest you have shown in its work and offers you its promise of continued cooperation.

REPORT OF COMMITTEE ON UNIFORMITY IN WEIGHTS AND MEASURES REQUIREMENTS[1]

Mr. Chairman and members of the conference, we, your committee appointed to consider ways and means for bringing about a more general uniformity in weights and measures regulations and requirements, recommend:

1. That members of the conference continue consideration of the recommendations printed on page 116 of the Report of the Twenty-second National Conference on Weights and Measures.

2. That a committee be continued to further investigate ways and means of bringing about uniformity in weights and measures requirements and regulations, and to take such action as authorized in correspondence by the members of this conference.

(Signed) J. H. Meek, *Chairman*,
Philip T. Pilon,
C. P. Smith,
Albert B. Smith,

Committee on Uniformity in Weights and Measures Requirements.

(A motion was made and seconded that the report be accepted, the question was taken, and the motion was agreed to.)

REPORT OF COMMITTEE ON NOMINATIONS, PRESENTED BY H. S. JARRETT, CHAIRMAN, AND ELECTION OF OFFICERS

We, your committee on nominations, beg leave to submit the following report.

We present the following as officers of the National Conference on Weights and Measures for the ensuing term: S. W. Stratton, honorary president; George K. Burgess, president; Albert B. Smith, first vice president; I. L. Miller, second vice president; F. S. Holbrook, secretary; and George F. Austin, jr., treasurer.

Executive committee: George K. Burgess, Albert B. Smith, I. L. Miller, F. S. Holbrook, George F. Austin, jr., D. P. Kimball, Thomas Flaherty, Edward J. Maroney, George M. Roberts, Howard E. Crawford, W. T. Fossett, P. T. Sullivan, C. V. Fickett, S. T. Griffith, Francis Meredith, S. C. Dinsmore, H. A. Webster, Joseph G. Rogers,

[1] In the absence of Mr. Meek, chairman, this report was read to the conference by F. S. Holbrook, secretary.

Digitized by Google

William A. Payne, William A. Graham, J. C. Tinkey, H. N. Davis, B. W. Ragland, George Warner, and John H. Hennessey.

The CHAIRMAN. I will ask Mr. Jarrett to take the chair.

(Mr. Jarrett, first vice president, took the chair.)

Mr. RAGLAND. Mr. President, I have been placed in many embarrassing positions. I have the highest regard for the committee on nominations. Every separate individual is a personal friend of mine, but unfortunately this conference in all its wisdom has failed to adopt any by-laws or constitution, and therefore it is necessary to resort to parliamentary procedure. I move that we vote on each separate recommendation of the committee.

The ACTING CHAIRMAN. Is there a second to the motion?

Mr. RAGLAND. According to parliamentary proceedings, I do not think a motion needs a second.

(There was no second to the motion.)

(It was moved and seconded that the report of the committee be accepted, the question was taken, and the motion was agreed to.)

(It was moved and seconded that the nominations be closed, and that the secretary be directed to cast the ballot of the conference for the officers and members of the executive committee, as nominated, the question was taken, and the motion was agreed to.)

(Accordingly, the secretary cast the ballot of the conference for the officers and members of the executive committee as nominated by the committee on nominations, and they were declared duly elected.)

(Doctor Burgess assumed the chair.)

The CHAIRMAN. Regarding the question of constitution and by-laws, it is the opinion of your chairman that we get along pretty well as it is, but if it is the desire of the conference to set up a set of rules and regulations to guide its activities, of course that may be done.

REPORT OF COMMITTEE ON RESOLUTIONS, PRESENTED BY C. D. BAUCOM

Mr. Chairman, your committee on resolutions respectfully submit and recommend for adoption the following resolutions:

IN MEMORY OF WILLIAM F. CLUETT.

Whereas we have lost from our ranks a beloved coworker, William F. Cluett, and

Whereas in all our associations with Mr. Cluett he has given us an ideal to strive for in our public service, and

Whereas he has done much for the advancement of the honest weights and measures cause in this country: Therefore be it

Resolved, That we, the National Conference on Weights and Measures, assembled at the Bureau of Standards, Washington, D. C., June 2–5, 1931, do hereby draw up this resolution as an expression of our sincere sorrow at his passing; and be it further

Resolved, That this resolution be made a part of the records of this conference, and that the secretary send a copy to Mr. Cluett's family.

IN MEMORY OF A. W. SCHWARTZ

Whereas by the death of A. W. Schwartz, this National Conference on Weights and Measures has lost one of its most valued members, and

Whereas Mr. Schwartz was ever ready with counsel and encouragement, based on long experience, to assist any one of us in meeting the problems of this work: Therefore, be it

Digitized by Google

Resolved, That we, the National Conference on Weights and Measures, assembled at the Bureau of Standards, Washington, D. C., June 2–5, 1931, do hereby pass this resolution in memory of our departed brother; and be it further

Resolved, That this resolution be made a part of the records of this conference and a copy be sent by the secretary to Mr. Schwartz's family.

IN MEMORY OF J. HARRY FOLEY

Whereas in the plan of Divine Providence our good brother, J. Harry Foley, has been called from his work among us, and

Whereas Mr. Foley made equity and justice a part of his every-day life that will ever be an inspirational memory of him: Therefore, be it

Resolved, That we, the National Conference on Weights and Measures, assembled at the Bureau of Standards, Washington, D. C., June 2–5, 1931, do hereby pass this resolution of deep regret at the loss of Mr. Foley from our work and association: And be it further

Resolved, That this resolution be made a part of the records of this conference and that a copy be sent by our secretary to Mr. Foley's bereaved family.

PROVISION OF PLACE FOR SEAL ON SCALES

Whereas the seal of approval, be it a lead seal, seal tag, or other mark or device, placed on a scale by the inspector or sealer of weights and measures, is the indication of accuracy and conformity to regulations and specifications passed by this conference and is the only mark of assurance to the public and others interested: Be it

Resolved, That this National Conference on Weights and Measures in convention assembled this 5th day of June, 1931, recommend to the manufacturers of scales intended or distributed for use in retail trade that a suitable place for the fastening or stamping of the annual lead seal, seal tag, or other mark or device be designed and made a part of the scale so that the approval of the inspector or sealer shall be in plain view of the public or trade.

APPRECIATION TO E. O. WAY AND D. J. M'LEAN

Whereas E. O. Way, Director, Weights and Measures Inspection Service, Department of Trade and Commerce of Canada, and D. J. McLean, superintendent of this service, have prepared and presented a splendid and inspiring paper at this, our Twenty-fourth National Conference on Weights and Measures, and

Whereas by the presence of Mr. McLean and the delivery of the above-mentioned paper written by Mr. Way, these gentlemen have contributed to the success of our conference: Therefore be it

Resolved, That the National Conference on Weights and Measures extend its appreciation and thanks to Mr. Way and Mr. McLean.

APPRECIATION TO HON. CHARLES WEST

Whereas Hon. Charles West, Member of Congress, seventeenth district of Ohio, has by his inspiring and educational address aided the delegates to better serve their respective States: Therefore be it

Resolved, That we, the Twenth-fourth National Conference on Weights and Measures, extend our grateful appreciation to Hon. Charles West.

APPRECIATION TO THE DIRECTOR AND STAFF OF THE BUREAU OF STANDARDS

Whereas the President of our National Conference on Weights and Measures and his able staff have extended valuable assistance and guidance to the conference: Therefore, be it

Resolved, That the conference records its sincere and grateful appreciation to Dr. George K. Burgess and his staff.

INDORSEMENT OF ACTIVITIES OF NATIONAL SCALE MEN'S ASSOCIATION

Whereas the National Scale Men's Association, through its secretary, C. L. Richard, has presented to this conference a report outlining its several current activities, and

Digitized by Google

Whereas we believe those activities to be conceived and executed in harmony with the aims of this conference: Therefore be it

Resolved, That this National Conference on Weights and Measures express its indorsement of these projects of the National Scale Men's Association, and that the secretary of the conference be directed to transmit a copy of this resolution to the National Scale Men's Association.

APPRECIATION TO THE PRESS

Whereas the representatives of the press of Washington have given valuable space in their papers and have given freely of their time in the interest of publicity of the proceedings of our conference: Therefore be it

Resolved, That we, the Twenty-fourth National Conference on Weights and Measures, express our appreciation to the press for such services.

APPRECIATION TO THE MANAGEMENT OF THE MAYFLOWER HOTEL

Whereas the management of the Mayflower Hotel has rendered most courteous and efficient service to the delegates of the Twenty-fourth National Conference on Weights and Measures: Therefore be it

Resolved, That the conference extend its appreciation and thanks to such management.

Respectfully submitted.

(Signed) GEO. WARNER, *Chairman*,
MILO C. GRIFFIN,
HAROLD A. WEBSTER,
SANFORD C. DINSMORE,
C. D. BAUCOM,
Committee on Resolutions.

DISCUSSION OF ABOVE REPORT

(It was moved and seconded that the report of the committee on resolutions be adopted.)

Mr. WOODLAND. In regard to the placing of a suitable plate on the scale for sealing, I believe as a matter of fact that that may be impossible until the sealers fix upon a certain kind of seal. In some jurisdictions they employ a lead and wire seal hooked through a hole; in others, a paper seal. If the method were standardized the manufacturers could provide for that.

Mr. GRIFFITH. I might say that the object of the resolution is to assure the public or trade that the device is approved. As it is to-day scales are sealed in some very awkward places and usually with the lead seal out of sight of the public, and it should be the concern of all manufacturers, sealers, and users of scales that the seal of approval is in view of the public. The scale manufacturers should accept the recommendation and provide a place for the seal.

Mr. CARLETON. Mr. President, you gentlemen in the East may make it a practice to use lead and wire seals, but I know in Illinois and Wisconsin they use a paper sticker and it would be unnecessary to provide a special place for this. I think it would be a good idea for you to decide at some future time to have a uniform type of seal over the country. I do not think it would be fair at the present time to require manufacturers to provide a place for a wire seal.

Mr. BAUCOM. This is only a recommendation or suggestion that the manufacturers give the matter consideration.

The CHAIRMAN. The question is on the adoption of the resolutions presented by the committee.

(The question was taken, and the motion was agreed to.)

Digitized by Google

REPORT OF THE TREASURER, GEORGE F. AUSTIN, JR.

Gentlemen of the conference, I herewith submit my report as treasurer of the National Conference on Weights and Measures, for the year ending June 1, 1931.

Receipts:		
Balance on hand June 3, 1930		$443.01
Dues received from delegates		200.00
Interest on bank deposit		9.93
Total receipts		652.94
Disbursements:		
Flowers in memory of L. A. Fischer	$10.00	
Flowers for William F. Cluett (June 5, 1930)	10.60	
Cigars for reporter	15.00	
Candy for stenographers	9.00	
R. W. Smith—special services incident to meeting	10.00	
R. N. Smith—miscellaneous expenses, telephone, etc	3.50	
Conference gift for relief of William F. Cluett (approved by vote of conference on June 6, 1930)	500.00	
Flowers in memory of William F. Cluett (October 18, 1930)	10.00	
Flowers in memory of A. W. Schwartz (February 6, 1930)	10.00	
Total disbursements		578.10
Balance on hand June 1, 1931		74.84

Respectfully submitted.

(Signed) GEO. F. AUSTIN, *Treasurer.*

Mr. R. W. SMITH. Mr. President, before that vote is taken may I make an explanation of those miscellaneous items. It is necessary in the conduct of our conference to make certain miscellaneous expenditures. Usually I take care of those personally and in all cases turn over the receipted vouchers to the treasurer and he looks to me to report what advances I have made. I want to assure you that none of the funds involved are for my personal credit.

(The report was duly accepted.)

Mr. GRIFFITH. Mr. Chairman, this conference has been of most unusual interest to me, and apparently one that has been of interest to others as well as myself.

I wonder if anyone has knowledge of the number of delegates present.

Mr. R. W. SMITH. I believe our total registration is well over 250 this year.

Mr. RAGLAND. Mr. President, I was elected a member of the executive committee against my wishes. I wish we could deviate just a little from precedent and that this executive committee, which has the decision in its hands, would bring the conference to Richmond, Va., as the guest of the greatest Commonwealth in the world. I hope you will think over it, dream over it, and next year you will be right down in Virginia.

WREATH IN MEMORY OF LOUIS A. FISCHER

Mr. HOLBROOK. Mr. President, may I announce that in accordance with the usual practice of the conference, the grave of Louis A. Fischer, our beloved former secretary, was decorated on the day before Memorial Day. This year, in view of the fact that the com-

Digitized by Google

mittee on specifications and tolerances was in session, the group paying this tribute consisted of Mr. Miller, Mr. Payne, Mr. Rogers, Mr. Ralph Smith, and myself.

MOTION IN RELATION TO EXPENDITURES

Mr. HOLBROOK. I move that the regular and customary expenses of the conference be voted as in the past.

(The motion was seconded, the question was taken, and the motion was agreed to.)

FIXING OF TIME AND PLACE OF NEXT MEETING

The CHAIRMAN. Is there any new business?

Mr. HOLBROOK. Mr. President, we are given to believe that next year is going to be a very crowded year in Washington. The George Washington Bicentennial celebration will occur, and if plans mature as it is expected they will mature there will be a very large number of visitors in town from time to time and the hotel facilities will be taxed to a great extent. In view of this and in view of the large number of conferences which will be held in town, it may be advisable at this time to depart from our usual practice of fixing the date of the conference only a few months before the conference is to take place and instead, fix the date, at least tentatively, now. I say tentatively because this conference is relatively a small one and did we fix a date now that was afterwards found to be in conflict with a very large organization, it might be incumbent upon us to vary from the date fixed now, and to fix on some more favorable date. It is also a fact that the hotels next year will probably book very many more advance reservations than usual and could the hotel be selected now it would be possible to guarantee the accommodations needed upon the dates fixed.

Next year there will be special celebrations in town during the week of Memorial Day, and also I understand during the week including June 14, which is Flag Day. We are advised by the centennial organization that in both those weeks unusually large crowds are expected; this might interfere with our accommodations. We have, if you desire to consider them, proposals from three hotels in this city submitting rates for the next conference, with guaranties that if the date is now fixed, the convention will be taken care of. If it is desired by the conference, the proposals can be read and the consensus of the conference developed as to the proper hotel and the proper dates for next year's meeting.

Mr. BAUCOM. Mr. President, I move that we pass on the time and place now, subject to change.

(The motion was seconded, the question taken, and the motion was agreed to.)

The CHAIRMAN. Is there any suggestion as to the date?

Mr. HUBELE. How about in May; it may be a better month to get away from the crowd?

The CHAIRMAN. The Chair recalls that due to the reduced railroad fares that become effective about June 1, we have been meeting after that date to give our friends from the west the advantage of those rates. That is important.

Digitized by Google

Mr. HOLBROOK. Some of the hotels offer extremely special rates, but it was specified that those rates will be granted only after June 1.

Mr. FLAHERTY. I move you, Mr. Chairman, that the conference be held during the first full week in June.

The CHAIRMAN. The Chair understands the motion to be that the conference be held the first full week in June, subject to revision if found necessary, and that the details of that be left to the secretary.

(The motion was seconded, the question was taken, and the motion was agreed to.)

(After consideration the conference decided to meet at the Willard Hotel.)

The CHAIRMAN. The last item on the program, Suggestions for Program of Twenty-fifth Conference, is of very considerable importance. I think the executive committee is to be congratulated on the program which has been prepared for this year. However, continuous efforts must be made if we are to keep the programs up to the fine standards set. At any time suggestions as to program items are very welcome. Is there any further business, gentlemen?

(A motion was made and seconded that the conference adjourn, the question was taken, and the motion was agreed to.)

(Thereupon, at 12.17 p. m., the Twenty-fourth National Conference on Weights and Measures adjourned sine die.)

Digitized by Google

APPENDIXES

APPENDIX I.—SPECIFICATIONS AND TOLERANCES FOR LUBRICATING-OIL BOTTLES, AS AMENDED BY THE TWENTY-FOURTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES, JUNE 2, 1931

FOREWORD

As adopted by the Twenty-first National Conference on Weights and Measures held in 1928 the code of specifications and tolerances for lubricating-oil bottles contained a note reading as follows:

NOTE.—These specifications and tolerances are to be put into force and effect on January 1, 1929, and are to be nonretroactive. However, after July 1, 1930, all bottles in use may be required to comply with these specifications and tolerances.

Since both of the dates mentioned in the above note have now passed it has no further application and it is therefore dropped in this republication. Whether the code is to be retroactive or nonretroactive in any jurisdiction seems largely to depend on what has been done up to the present time in relation to its adoption in the jurisdiction in question. Thus in a jurisdiction hereafter adopting the code for the first time, it seems that it should at first be made nonretroactive as of the date of adoption, and that at some following date all bottles in use might be required to comply, as was the recommendation in the original instance. In the meantime in dealing with bottles in use, the official will doubtless enforce the same requirements which he was accustomed to enforce up to the time of adoption, in the elimination of incorrect bottles or those of such construction that they should not be permitted in use. In a jurisdiction which has adopted this code in the past the effective dates may already have been set. Since the amendments made at the twenty-fourth conference were largely in the nature of liberalization of existing requirements it is considered that no additional time need be granted as a result of such changes. If dates were not settled at the time of adoption, then there should be fixed such dates as are indicated as reasonable in view of conditions existing in the jurisdiction.

SPECIFICATIONS AND TOLERANCES FOR LUBRICATING-OIL BOTTLES

DEFINITION.—Lubricating-oil bottles shall be construed to include all bottles used for the sale of lubricating oils for immediate delivery to the crank case of a motor vehicle, whether or not the bottle is used to determine the quantity of oil sold and whether or not it is sealed with a cap or some other device.

SPECIFICATIONS.—1. Lubricating-oil bottles shall be made of clear, uncolored glass and only in sizes heretofore specified under the heading "Liquid capacity measures." They shall be made to contain their

Digitized by Google

indicated capacities at a temperature of 20° C. (68° F.), and they shall not be subdivided.

2. A lubricating-oil bottle shall be marked on the side with its capacity and on the side or bottom with the name, initials, or trademark of the manufacturer.

3. A lubricating-oil bottle shall be provided with a clearly defined graduation line indicating its capacity, and with the words "Fill to line," "One quart to line," or a similar and suitable inscription, clearly referring to this capacity line. The capacity line shall occupy at least one-half of the circumference of the bottle, and shall not be more than 0.10 inch in width. This specification shall not be construed to prohibit the placing of an auxiliary line above the capacity line, to serve as a guide for filling with an excess measure of oil, but in case such auxiliary line is provided it shall be undesignated and shall be less prominent than the capacity line so that it will not be confused therewith.

4. A lubricating-oil bottle shall be so designed and constructed that the capacity of that portion of it above the capacity line is at least 3 cubic inches and that there shall be at least one-fourth inch clear space between the capacity line and any metal or other opaque top or spout when such top or spout is screwed firmly into place or otherwise securely attached.

5. A lubricating-oil bottle shall be correct within the tolerance provided when filled so that the top of the meniscus of the water which is used in the test of the bottle coincides with the bottom of the capacity line.

6. A lubricating-oil bottle shall be so designed and constructed that free and unobstructed drainage is provided.

7. All markings or graduations required by the provisions of these specifications shall be blown or otherwise permanently marked in or on the lubricating-oil bottle, and shall be clear and distinct.

TOLERANCES.—The tolerances to be allowed on lubricating-oil bottles shall be in excess only and shall be the values shown in the following table. There shall be no tolerance allowed in deficiency.

Capacity of bottle	Tolerance	
	Drams	Cubic inches
2 quarts	12	2.7
1 quart	8	1.8
1 pint	6	1.4

APPENDIX II.—TENTATIVE SPECIFICATIONS, TOLERANCES, AND REGULATIONS FOR PERSON WEIGHERS, ADOPTED BY THE TWENTY-FOURTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES, JUNE 4, 1931

FOREWORD

The Twenty-fourth National Conference on Weights and Measures adopted the following code of specifications, tolerances, and regulations for person weighers tentatively, in accordance with its usual custom. It will accordingly be reviewed by the committee

Digitized by Google

during the coming year, and will be offered for final adoption at the next conference. In the interim, officials, manufacturers, users, and all other interested parties are invited to submit to the committee any suggestions and criticisms which may occur to them, in order that the code may be revised, if necessary or advisable, before it is presented for final adoption. Such comments may be addressed to the chairman of the committee on specifications and tolerances, National Conference on Weights and Measures, or to any member of the committee, which is as follows:

F. S. Holbrook, Bureau of Standards, Washington, D. C.

Charles M. Fuller, city and county sealer of weights and measures, Los Angeles, Calif.

I. L. Miller, State commissioner of weights and measures, Indianapolis, Ind.

Joseph G. Rogers, assistant State superintendent of weights and measures, Trenton, N. J.

W. A. Payne, county sealer of weights and measures of Monroe County, Rochester, N. Y.

SPECIFICATIONS, TOLERANCES, AND REGULATIONS FOR PERSON WEIGHERS

NOTE.—The following specifications, tolerances, and regulations shall apply to person weighers in those cases in which they are used or to be used commercially—that is, when a charge is made for the weighing service—and such use shall be permitted only when the provisions of this code are complied with. Whenever noncommercial person weighers are inspected and tested by the weights and measures official, it is recommended that these be officially sealed only when they comply with these specifications and tolerances.

DEFINITIONS.—A person weigher is a scale of any type which is specially designed for the weighing of persons. This definition is not to be construed to include scales specifically designed for the weighing of infants and children.

A "beam" person weigher is one in which weight indications are obtained by the manipulation of one or more beam poises.

An "automatic-indicating" person weigher is one in which weights are automatically indicated on a reading face of any type.

A "ticket" person weigher is one in which a representation of each individual weight is automatically made upon a ticket, card, etc., which is automatically delivered to a suitable receptacle on the outside of the scale.

SPECIFICATIONS.—1. A person weigher shall have a capacity of not less than 250 pounds.

2. A person weigher shall be so designed and constructed that it has a definite and clear zero graduation and gives a definite and clear indication of its zero balance condition at all times when ready for use. In the case of an automatic-indicating or ticket person weigher the zone throughout which the zero balance condition shall be indicated shall correspond to at least 5 pounds on each side of the zero graduation.

3. A person weigher shall be so designed and constructed that it is susceptible of giving weight indications at all points between zero and capacity: Provided, however, That a person weigher may have an interval between zero and some definite weight value throughout

Digitized by Google

which weight values are not given, but in this case the person weigher shall be so designed and constructed that whenever the weight on the platform is such as to fall within this interval, any coin inserted will be returned to the user through automatic delivery to a suitable receptacle on the outside of the person weigher.

4. The maximum value of the minimum weight graduations on any person weigher shall be 1 pound.

5. A person weigher whose weight indication is changed by an amount greater than one-half the tolerance allowed, when set in any position on a surface making an angle of 5 per cent or approximately 3° with the horizontal, shall be equipped with a device which will indicate when the person weigher is level, and in no case shall any pendulum operating the person weigher be considered a leveling device. The person weigher shall be rebalanced at zero each time its position is altered during the test contemplated by this specification.

6. All devices for adjusting the balance condition or the level of a person weigher shall be of such construction that they are operative or accessible only by the use of some tool or device which is outside of and entirely separate from the device in question, such as a screw driver, wrench, etc., but not an adjusting pin.

7. A person weigher which is liable to give incorrect results except when special precautions are observed shall have appropriate and explicit instructions conspicuously, clearly, and permanently marked upon it.

8. A ticket person weigher shall be so designed and constructed that throughout a period when the supply of tickets is exhausted, any coin which is inserted will be returned to the user through automatic delivery to a suitable receptacle on the outside of the person weigher, or the insertion of a coin in the coin slot will automatically be prevented.

9. A ticket person weigher shall be so designed and constructed that the printing, stamping, or transferring of the weight record on the ticket will not occur until the weighing mechanism has had ample opportunity to come to rest, under normal person weighing conditions.

10. A ticket person weigher shall be so designed and constructed that it is susceptible of giving a clear, distinct, and definite statement or representation of weight on the weight ticket.

This specification shall be construed to require that the specifications contained in this code and the specifications for automatic-indicating scales, relative to weight indicators, weight graduations, clear intervals between weight graduations, etc., shall apply to the representations of weight made by a ticket person weigher, when this representation is such as to make these requirements applicable. These requirements shall be broadly applied to appropriate portions of the said representations so as to require the same degree of clearness, definiteness, precision of reading, etc., in the case of both ticket and automatic-indicating person weighers.

11. When not modified by the requirements of this code the specifications given under the heading "Scales—General specifications," "Platform scales," and "Automatic-indicating scales" shall apply to person weighers in so far as they are applicable.

Digitized by Google

SENSIBILITY RECIPROCAL (SR).—The maximum SR allowable on beam person weighers shall be the value of two of the minimum graduations on the beam at the capacity or at any lesser load: Provided, however, That the manufacturers' maximum SR or the maximum SR on all new beam person weighers shall be the value of one of the minimum graduations on the beam, at the capacity or at any lesser load.

TOLERANCES.—The tolerances to be allowed in excess or deficiency on beam person weighers shall be those specified under the heading "Platform scales." The tolerances to be allowed in excess or deficiency on automatic-indicating and ticket person weighers shall be those specified under the heading "Large-capacity automatic-indicating scales."

REGULATIONS.—1. A person weigher shall be maintained in level.

2. A ticket person weigher shall be so maintained in use that all statements or representations of weight printed, stamped, or otherwise transferred on or to the weight ticket during operation shall be clear and distinct.

3. A person weigher shall be permanently and legibly marked with a statement containing the name and address of the person, firm, or corporation responsible for placing the person weigher in service, in combination with some such words as "Operated by," "Maintained by," etc.: Provided, however, That such statement shall not be required when the person weigher is in service on the premises of such person, firm, or corporation.

○

Digitized by Google

CORNELL
UNIVERSITY
LIBRARY

Digitized by Google

U. S. DEPARTMENT OF COMMERCE
DANIEL C. ROPER, Secretary
NATIONAL BUREAU OF STANDARDS
LYMAN J. BRIGGS, Director

MISCELLANEOUS PUBLICATION M156

REPORT OF THE TWENTY-FIFTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

ATTENDED BY REPRESENTATIVES
FROM VARIOUS STATES

HELD AT THE NATIONAL BUREAU OF STANDARDS
WASHINGTON, D. C., JUNE 4, 5, 6, and 7, 1935

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1936

For sale by the Superintendent of Documents, Washington, D. C. - - - - - - - Price 20 cents

Digitized by Google

459350

Digitized by Google

OFFICERS AND COMMITTEES

OFFICERS

(Serving during Twenty-fifth National Conference)

Presiding officer, JOHN P. MCBRIDE, director, State division of standards, Boston, Mass.
Secretary, F. S. HOLBROOK, National Bureau of Standards, Washington, D. C.
Treasurer, GEORGE F. AUSTIN, Jr., supervising inspector of weights and measures, Detroit, Mich.

(As elected by Twenty-fifth National Conference for the ensuing year)

President, LYMAN J. BRIGGS, Director, National Bureau of Standards, Washington, D. C.
First vice president, JOHN P. MCBRIDE, director, State division of standards, Boston, Mass.
Second vice president, C. D. BAUCOM, State superintendent of weights and measures, Raleigh, N. C.
Third vice president, MARTIN L. LANG, State commissioner of weights and measures, Indianapolis, Ind.
Fourth vice president, J. C. TINKEY, deputy State sealer, Columbus, Ohio.
Secretary, F. S. HOLBROOK, National Bureau of Standards, Washington, D. C.
Treasurer, GEORGE F. AUSTIN, Jr., supervising inspector of weights and measures, Detroit, Mich.

COMMITTEES

EXECUTIVE COMMITTEE

(As elected by Twenty-fifth National Conference)

LYMAN J. BRIGGS.
JOHN P. MCBRIDE.
C. D. BAUCOM.
MARTIN L. LANG.
J. C. TINKEY.
F. S. HOLBROOK.
GEORGE F. AUSTIN, Jr.
} *Ex officio.*

GEORGE S. BARNARD, director, State bureau of foods and standards, Lansing, Mich.
JOHN S. BURKE, superintendent of weights and measures, Jersey City, N. J.
HOWARD E. CRAWFORD, inspector of weights and measures, Jacksonville, Fla.
H. N. DAVIS, deputy State commissioner of weights and measures, Montpelier, Vt.
URBAN E. DICE, chief inspector of weights and measures of Allegheny County, Pittsburgh, Pa.
S. T. GRIFFITH, chief, division of weights and measures, Baltimore, Md.
JOHN J. LEVITT, State superintendent of standards, Springfield, Ill.
SETH L. LIGHTFOOT, State inspector of weights and measures, Phoenix, Ariz.
C. R. MCFADDEN, deputy sealer of weights and measures of Licking County, Pataskala, Ohio.
ROLLIN E. MEEK, chief State inspector of weights and measures, Indianapolis, Ind.
B. W. RAGLAND, chief, bureau of weights and measures, Richmond, Va.
C. J. REYNOLDS, director, State bureau of weights and measures, Albany, N. Y.
LOUIS G. WALDMAN, commissioner of weights and measures, St. Louis, Mo.
GEORGE WARNER, chief State inspector of weights and measures, Madison, Wis.
WALTER G. WHITE, State commissioner of weights and measures, Concord, N. H.
S. H. WILSON, State oil chemist, Atlanta, Ga.

Digitized by Google

COMMITTEE ON SPECIFICATIONS AND TOLERANCES

(Standing committee)

F. S. HOLBROOK, National Bureau of Standards, Washington, D. C.
CHARLES M. FULLER, city and county sealer of weights and measures, Los Angeles, Calif.
JOSEPH G. ROGERS, assistant State superintendent of weights and measures, Trenton, N. J.
JOHN P. MCBRIDE, director, State division of standards, Boston, Mass.
GEORGE F. AUSTIN, Jr.,[1] supervising inspector of weights and measures, Detroit, Mich.

ACTING COMMITTEES FOR THE TWENTY-FIFTH NATIONAL CONFERENCE

Special Committee on Resolutions.—JAMES A. BOYLE, of Portland, Maine, chairman; WALTER G. WHITE, of New Hampshire; and GLENN L. BERRY, of Monmouth County, N. J.

Committee on Resolutions.—C. D. BAUCOM, of North Carolina, chairman; JOHN J. LEVITT, of Illinois; GEORGE S. BARNARD, of Michigan; WALTER F. STILES, of Connecticut; ALEXANDER HAMILTON, of New York, N. Y.; WILLIAM F STEINEL, of Milwaukee, Wis.; and JACOB M. VANDERSLICE, of Philadelphia County, Pa.

Committee on Nominations.—J. C. TINKEY, of Ohio, chairman; H. N. DAVIS, of Vermont; JOHN S. BURKE, of Jersey City, N. J.; HOWARD E. CRAWFORD, of Jacksonville, Fla.; and ROLLIN E. MEEK, of Indiana.

In Charge of Exhibits.—B. L. PAGE.

In Charge of Registrations.—Mrs. H. E. ROSENBERGER.

[1] Mr. Austin consented to serve on the committee only during the period of the Twenty-fifth National Conference.

Digitized by Google

PERSONS ATTENDING THE CONFERENCE

DELEGATES—STATE, CITY, AND COUNTY OFFICIALS

ARIZONA

State—Seth L. Lightfoot, inspector of weights and measures, Statehouse, Phoenix.

CONNECTICUT

State—Walter F. Stiles, captain, department of State police, 100 Washington Street, Hartford.
C. L. Klocker, department of State police, 100 Washington Street, Hartford.

DISTRICT OF COLUMBIA

District—George M. Roberts, superintendent of weights, measures, and markets, 467 C Street, Washington.
W. C. Diller, chief inspector of weights, measures, and markets, 467 C Street, Washington.
John L. F. Keenan, inspector of weights, measures, and markets, 467 C Street, Washington.

FLORIDA

State—Nalls Berryman, assistant State chemist, department of agriculture, Tallahassee.
City: Jacksonville—Howard E. Crawford, inspector of weights and measures, Utilities Building.

GEORGIA

State—S. H. Wilson, State oil chemist, 134 State Capitol, Atlanta.
J. T. Williams, Sr., inspector, State oil division, Americus.

ILLINOIS

State—John J. Levitt, superintendent of standards, Capitol Building, Springfield.
City: Chicago—James O'Keefe, inspector of weights and measures, City Hall.

INDIANA

State—Martin L. Lang, commissioner of weights and measures, Statehouse Annex, Indianapolis.
Rollin E. Meek, chief inspector of weights and measures, Statehouse Annex, Indianapolis.
Herbert G. Meyer, inspector of weights and measures, Statehouse Annex, Indianapolis.

City:
East Chicago—Mrs. Clark McQuilkin, sealer of weights and measures.
Gary—Thomas G. Nason, sealer of weights and measures.

County: Cass—Elmer Elliott, inspector of weights and measures, Logansport.

Digitized by Google

KENTUCKY

City: Louisville	WILLIAM H. ISING, Jr., chief inspector of weights and measures, 201 City Hall.

MAINE

State	JOHN H. AUSTIN, deputy sealer of weights and measures, Augusta.
City:	
Portland	JAMES A. BOYLE, sealer of weights and measures, City Building.
Waterville	WILLIAM A. JONES, sealer of weights and measures, City Hall.

MARYLAND

City: Baltimore	S. T. GRIFFITH, chief, division of weights and measures, City Hall. CHARLES G. CROCKETT, inspector of weights and measures, City Hall. JOHN R. GRAEFF, inspector of weights and measures, City Hall. GEORGE H. LEITHAUSER, inspector of weights and measures, City Hall. THOMAS J. NAPFEL, inspector of weights and measures, City Hall. ELMER E. NICHOLSON, inspector of weights and measures, City Hall. FRED J. O'GORMAN, inspector of weights and measures, City Hall. ELMER S. PIERPONT, inspector of weights and measures, City Hall. HENRY J. SLITZER, assistant inspector of weights and measures, City Hall.
County: Anne Arundel	Mrs. TABITHA C. MCGINNIS, inspector of weights and measures, Glen Burnie.

MASSACHUSETTS

State	JOHN P. MCBRIDE, director of standards, Statehouse, Boston.
City:	
Beverly	ROBERT J. RAFFERTY, sealer of weights and measures, City Hall.
Springfield	E. M. BEEBE, deputy sealer of weights and measures.
Taunton	EDWARD C. WARD, sealer of weights and measures, City Hall.

MICHIGAN

State	GEORGE S. BARNARD, director, bureau of foods and standards, Lansing.
City:	
Detroit	GEORGE F. AUSTIN, Jr., supervising inspector of weights and measures, 1300 Beaubien Street.
Lansing	CARL A. BUNDENTHAL, sealer of weights and measures, Municipal Market Building.
County:	
Jackson	IRVING G. WHEELER, sealer of weights and measures, 140 South Jackson Street, Jackson.
Washtenaw	GEORGE P. SMITH, sealer of weights and measures, Courthouse, Ann Arbor.

MISSOURI

City: St. Louis	LOUIS G. WALDMAN, commissioner of weights and measures, 12 City Hall.

Digitized by Google

NEW HAMPSHIRE

State	WALTER G. WHITE, commissioner of weights and measures, Statehouse, Concord.

NEW JERSEY

State	JOSEPH G. ROGERS, assistant superintendent and secretary, department of weights and measures, 187 West Hanover Street, Trenton. ROWLAND K. BODENWIESER, assistant superintendent of weights and measures, 187 West Hanover Street, Trenton. ELLIOTT B. HOLTON, assistant superintendent of weights and measures, 187 West Hanover Street, Trenton. HARRY S. PROVOST, assistant superintendent of weights and measures, 187 West Hanover Street, Trenton. ARCHIE T. SMITH, inspector of weights and measures, 187 West Hanover Street, Trenton.
City:	
Elizabeth	WILLIAM J. BENDER, superintendent of weights and measures, City Hall.
Jersey City	JOHN S. BURKE, superintendent of weights and measures, City Hall.
Newark	WILLARD E. REED, superintendent of weights and measures, City Hall.
County:	
Bergen	A. F. BARNARD, superintendent of weights and measures, Hackensack.
Cape May	GILBERT S. SMITH, superintendent of weights and measures, Avalon.
Gloucester	WILLIAM P. ABDILL, superintendent of weights and measures, Woodbury.
Hudson	THOMAS J. WALDRON, superintendent of weights and measures, Courthouse, Jersey City.
Mercer	RALPH M. BODENWIESER, superintendent of weights and measures, Trenton.
Middlesex	CHARLES H. ENGELHARD, superintendent of weights and measures, County Offices, New Brunswick.
Monmouth	GLENN L. BERRY, superintendent of weights and measures, 706 Eighth Avenue, Asbury Park.
Morris	CHARLES S. WANDLING, superintendent of weights and measures, Courthouse, Morristown.
Passaic	WILLIAM MILLER, superintendent of weights and measures, 2 Laurel Street, Paterson.
Somerset	OLIVER B. MATHEWS, superintendent of weights and measures, Courthouse, Somerville.
Sussex	R. LEE SLATER, superintendent of weights and measures, Newton.

NEW YORK

City:	
Binghamton	L. E. REED, sealer of weights and measures.
Middletown	LLOYD W. FURMAN, sealer of weights and measures, 5 Winchester Avenue.
New York	ALEXANDER HAMILTON, deputy commissioner, department of public markets, weights, and measures, Municipal Building.
Rochester	MARTIN J. MACK, sealer of weights and measures, 34 Court Street.
Rome	W. E. OLIVER, sealer of weights and measures, City Hall.

Digitized by Google

NEW YORK—Continued

County:	
Monroe	FRED J. YOUNG, sealer of weights and measures, 1400 South Avenue, Rochester.
Oswego	L. M. FLOWER, sealer of weights and measures, Lycoming.
Tioga	HENRY L. EMMONS, sealer of weights and measures, Spencer.

NORTH CAROLINA

State	C. D. BAUCOM, superintendent of weights and measures, box 1066, Raleigh.
City: Winston-Salem	B. K. JONES, sealer of weights and measures.

OHIO

State	J. C. TINKEY, deputy State sealer, 710 State Office Building, Columbus.
City: Toledo	WILLIAM C. WITFOTH, sealer of weights and measures, 555 Erie Street.
County:	
Cuyahoga	GEORGE A. FISCHER, deputy sealer of weights and measures, New Courthouse, Cleveland.
Licking	C. R. MCFADDEN, deputy sealer of weights and measures, Pataskala.
Sandusky	RAY A. GOEBEL, deputy sealer of weights and measures, Fremont.
Trumbull	J. G. KIRKPATRICK, deputy sealer of weights and measures, Courthouse, Warren.
Wayne	ALBERT S. WEBER, deputy sealer of weights and measures, Courthouse, Wooster.

PENNSYLVANIA

City:	
Allentown	JAMES E. MCHUGH, inspector of weights and measures, City Hall.
Harrisburg	GEORGE B. NEBINGER, inspector of weights and measures.
New Kensington	JOHN H. EVANS, inspector of weights and measures.
York	IRVIN R. SHULTZ, inspector of weights and measures, City Hall.
County:	
Allegheny	URBAN E. DICE, chief inspector of weights and measures, Courthouse, Pittsburgh.
Centre	G. A. SPEARLY, inspector of weights and measures, Bellefonte.
Franklin	ROY G. KELL, inspector of weights and measures, 358 East Catherine Street, Chambersburg.
Indiana	H. T. MILLER, inspector of weights and measures, Indiana.
Mifflin	F. M. DIPPERY, inspector of weights and measures, Lewistown.
Philadelphia	EDWIN C. EMHARDT, supervisor, bureau of weights and measures, 306 City Hall, Philadelphia.
	JOHN B. MCCABE, district supervisor, bureau of weights and measures, 306 City Hall, Philadelphia.
	JACOB M. VANDERSLICE, district supervisor, bureau of weights and measures, 306 City Hall, Philadelphia.
	FRED KURZ, clerk and inspector, bureau of weights and measures, 306 City Hall, Philadelphia.
Pike	BYRON ADAMS, inspector of weights and measures, Matamoras.

Digitized by Google

PENNSYLVANIA—Continued.

County—Continued.	
Union	CALVIN F. BLOUCH, inspector of weights and measures, Lewisburg.
Westmoreland	EDWARD D. ANDERSON, inspector of weights and measures, Courthouse, Greensburg.
	F. W. MAINS, inspector of weights and measures, 1801 Victoria Avenue, Arnold.

VERMONT

State	H. N. DAVIS, deputy commissioner of weights and measures, Montpelier.

VIRGINIA

State	J. H. MEEK, director, division of markets, 1030 State Office Building, Richmond.
	M. A. HUBBARD, inspector of weights and measures, 1030 State Office Building, Richmond.
City:	
Danville	GEORGE S. DYER, sealer of weights and measures, 812 Green Street.
Richmond	B. W. RAGLAND, chief, bureau of weights and measures.
	C. D. GARBER, deputy sealer of weights and measures.
County: Arlington	E. M. MORELAND, inspector of weights and measures, Courthouse, Clarendon.

WEST VIRGINIA

State	S. M. MILLER, inspector of weights and measures, Charleston.
	PATSY J. PELLEGRINI, inspector of weights and measures, Charleston.
County: Marion	H. D. MARTIN, sealer of weights and measures, Fairmont.

WISCONSIN

City: Milwaukee	WILLIAM F. STEINEL, sealer of weights and measures, 1331 North Fifth Street.

OTHER DELEGATES, AND GUESTS APPEARING ON THE PROGRAM

BEAN, H. S., National Bureau of Standards, Washington, D. C.
BEARCE, H. W., National Bureau of Standards, Washington, D. C.
BRAITHWAITE, W. E., National Bureau of Standards, Washington, D. C.
CAREY, L. C., specialist in package standardization, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.
CRITTENDEN, E. C., Assistant Director, National Bureau of Standards, Washington, D. C.
DICKINSON, H. C., National Bureau of Standards, Washington, D. C.
DICKINSON, Hon. JOHN, Assistant Secretary of Commerce, Washington, D. C.
ELY, E. W., National Bureau of Standards, Washington, D. C.
FRISBIE, W. S., chief, division of State cooperation, Food and Drug Administration, United States Department of Agriculture, Washington, D. C.
GOULD, R. E., National Bureau of Standards, Washington, D. C.
HARRISON, M. J. J., chairman, committee on yards and terminals, American Railway Engineering Association, 574 Union Station Building, Chicago, Ill.
HOLBROOK, F. S., National Bureau of Standards, Washington, D. C.
JUDSON, L. V., National Bureau of Standards, Washington, D. C.
MCALLISTER, A. S., Assistant Director, National Bureau of Standards, Washington, D. C.
MILLER, D. R., National Bureau of Standards, Washington, D. C.
PEFFER, E. L., National Bureau of Standards, Washington, D. C.
PIENKOWSKY, A. T., National Bureau of Standards, Washington, D. C.
SMITH, D. V., National Bureau of Standards Master Scale Depot, 5800 W. 69th Street, Clearing Station, Chicago, Ill.

Digitized by Google

SMITH, RALPH W., National Bureau of Standards, Washington, D. C.
SOUDER, WILMER, National Bureau of Standards, Washington. D. C.
STROOP, D. V., engineer, and secretary, division of marketing, American Petroleum Institute, 50 West Fiftieth Street, New York, N. Y.

GUESTS REPRESENTING MANUFACTURERS OF WEIGHING AND MEASURING DEVICES

American Can Co:
HENRY B. TOURTELLOT, New York, N. Y.
ELMER NALL, salesman, 104 South Michigan Avenue, Chicago, Ill.
Barnes Products (Inc.): W. J. BARNES, president, Detroit, Mich.
Becker, Christian (Inc.): C. A. BECKER, manager, 147 Eighth Street, Jersey City, N. J.
Black & Decker Manufacturing Co.: E. E. POWELL, manager, loadometer sales, Towson, Md.
Bowser, S. F., & Co. (Inc.):
C. P. GRIFFITH, chief engineer, Fort Wayne, Ind.
E. C. MARSH, sales manager, Fort Wayne, Ind.
Brodie, R. N., Co. (Inc.): D. W. KINGSLEY, 425 Chrysler Building, New York, N. Y.
Buffalo Meter Co.: T. J. HARRINGTON, Buffalo, N. Y.
Chatillon, John, & Sons:
P. T. BORTELL, vice president, 89 Cliff Street, New York, N. Y.
J. GEORGE HUGEL, 89 Cliff Street, New York, N. Y.
Continental Can Co.: O. G. JAKOB, division sales manager, 100 East Forty-second Street, New York, N. Y.
Dayton Pump & Manufacturing Co.: G. W. EICHHOFF, eastern district manager, 441 Lexington Avenue, New York, N. Y.
Erie Meter Systems (Inc.):
L. O. CARLSON, president, Erie, Pa.
N. A. CARLSON, vice president, Erie, Pa.
Exact Weight Scale Co.: K. B. NEFF, secretary-treasurer, Columbus, Ohio.
Fairbanks, Morse & Co.:
C. A. HENNIE, sales representative, 205 Water Street, Baltimore, Md.
JEROME KENNEY, salesman, 205 Water Street, Baltimore, Md.
Gilbert & Barker Manufacturing Co.:
K. S. EDWARDS, sales manager, Springfield, Mass.
J. A. LOGAN, manager, new products division, Springfield, Mass.
S. C. HOPE, Springfield, Mass.
Gurley, W. & L. E.:
CHARLES I. DAY, president, 514 Fulton Street, Troy, N. Y.
FRANKLIN G. WILLIAMS, Washington representative, 3621 Newark Street, Washington, D. C.
Hayes Equipment Manufacturing Co.: W. F. VOGEL, general sales manager, Wichita, Kans.
Hobart Manufacturing Co.:
S. M. TEMPLETON, assistant manager, Dayton scale division, Troy, Ohio.
JOHN W. MILEWSKI, Washington manager, Dayton scale division, 43 Florida Avenue NE., Washington, D. C.
Howe Scale Co.:
E. P. VROOME, eastern sales manager, 111 Eighth Avenue, New York, N. Y.
C. A. LINDSAY, branch manager, 1011 Filbert Street, Philadelphia, Pa.
Huffman Manufacturing Co.: HORACE M. HUFFMAN, president, Dayton, Ohio.
Industrial Equipment Co.: F. J. RUSH, 116 Key Highway, Baltimore, Md.
International Business Machines Corporation:
HARRY S. EVANS, Washington manager, 1111 Connecticut Avenue, Washington, D. C.
L. S. SMITHERS, special representative, 270 Broadway, New York, N. Y.
International Ticket Scale Corporation: W. G. FITZGERALD, 17 East Forty-fifth Street, New York, N. Y.
Jacobs Bros. Co. (Inc.): J. E. WOODLAND, sales manager, detectogram division, Brooklyn, N. Y.
Joyce-Cridland Co.: ROBERT J. WARD, eastern sales manager, Graybar Building, New York, N. Y.
Kleckner, Wm. H. (Inc.): W. H. KLECKNER, president, 907 East Joppa Road, Towson, Md.

Digitized by Google

L N S Corporation: WILLIAM H. LOLLEY, president, 71 Murray Street, New York, N. Y.
Logan-Allington Oil Equipment Co.: E. W. ALLINGTON, 17 Battery Place, New York, N. Y.
Losey Personal Weighing Co.: GEORGE H. LOSEY, 3311 Oakfield Avenue, Baltimore, Md.
Martin & Schwartz (Inc.): E. O. HABHEGGER, district manager, 2636 West Girard Avenue, Philadelphia, Pa.
Milestone Meter Systems (Inc.): W. E. MILESTONE, president, 1603 East Twenty-seventh Street, Cleveland, Ohio.
Moore & Kling (Inc.): ELMER M. KLING, Boston, Mass.
National Meter Co.: N. J. MIANO, petroleum meter department manager, 4207 First Avenue, Brooklyn, N. Y.
National Pumps Corporation: ERIC S. BERGMAN, eastern manager, 122 East Forty-second Street, New York, N. Y.
Neptune Meter Co.:
JOHN H. BALLANTINE, president, 50 West Fiftieth Street, New York, N. Y.
R. K. BLANCHARD, vice president, 50 West Fiftieth Street, New York, N. Y.
CHARLES S. HAZARD, chief engineer, 50 West Fiftieth Street, New York, N. Y.
GLENN D. FRYE, research engineer, 50 West Fiftieth Street, New York, N. Y.
Oil Equipment Laboratories (Inc.): LYON MCCANDLESS, president, Rochester, Pa.
Oil Products Appliance Co. (Inc.): JOHN T. GOSSETT, 100 Sixth Avenue, New York, N. Y.
Owens-Illinois Glass Co.:
EDWARD F. GLACKEN, sales manager, milk bottle division, 965 Wall Street, Toledo, Ohio.
JOHN DUNCAN, Jr., 965 Wall Street, Toledo, Ohio.
Peerless Weighing Machine Co.:
HARRY M. GRISWOLD, vice president and general manager, 245 Fifth Avenue, New York, N. Y.
LEVERETT D. CHAMBERS, secretary, 245 Fifth Avenue, New York, N. Y.
E. M. SCHIEMER, 245 Fifth Avenue, New York, N. Y.
Pittsburgh Equitable Meter Co.:
W. H. MARSH, chief engineer, liquid meter division, 400 North Lexington Avenue, Pittsburgh, Pa.
H. I. BEARDSLEY, manager, oil and gasoline meter division, 400 North Lexington Avenue, Pittsburgh, Pa.
M. J. HARPER, New York manager, 50 Church Street, New York, N. Y.
Royal Scale Co.: B. B. ROCHESTIE, Trenton, N. J.
Service Station Equipment Co.:
J. C. WOODFORD, chief engineer, Conshohocken, Pa.
O. L. HOLCOMBE, engineer, Conshohocken, Pa.
D. S. WILLSON, testing engineer, Conshohocken, Pa.
C. L. MCMULLEN, sales representative, Conshohocken, Pa.
Seraphin Test Measure Co.: THEO. A. SERAPHIN, president, 1314 North Seventh Street, Philadelphia, Pa.
Sharpsville Boiler Works Co.: CHARLES D. FAGAN, president, Sharpsville, Pa.
Standard Computing Scale Co.: M. D. RIBBLE, vice president of sales, Detroit, Mich.
Streeter-Amet Co.:
HARRY M. ROESER, 4101 Ravenswood Avenue, Chicago, Ill.
WILLIAM WATERMAN, superintendent, 4101 Ravenswood Avenue, Chicago, Ill.
Toledo Scale Co.:
S. Q. BENNETT, manager, service and weights and measures, Toledo, Ohio.
SIDNEY F. MASHBIR, in charge Government sales division, 802 McLachlen Building, Washington, D. C.
Tokheim Oil Tank & Pump Co.: G. U. BRAKE, Fort Wayne, Ind.
Torsion Balance Co.: A. T. MILLROY, sales manager, 92 Reade Street, New York, N. Y.
Turner Automatic Devices (Inc.): H. C. TURNER, president, 205 East Forty-second Street, New York, N. Y.
Wayne Co.:
CHARLES C. NEALE, manager, weights and measures division, Fort Wayne, Ind.
M. C. BROWN, 608 American Building, Baltimore, Md.

Digitized by Google

GUESTS REPRESENTING TRADE AND ENGINEERING ASSOCIATIONS

American Petroleum Institute: DAVID V. STROOP, engineer and secretary, Division of Marketing, 50 West Fiftieth Street, New York, N. Y.
American Railway Engineering Association: M. J. J. HARRISON, chairman, committee on yards and terminals, 574 Union Station Building, Chicago, Ill.
Gasoline Pump Manufacturers Association: G. DENNY MOORE, managing director, 230 Park Avenue, New York, N. Y.
Glass Container Association:
W. S. RICHARDS, chairman, standardization committee, 965 Wall Street, Toledo, Ohio.
VICTOR L. HALL, secretary, standardization committee, 19 West Forty-fourth Street, New York, N. Y.

GUESTS REPRESENTING BUSINESS AND INDUSTRY

BALSTER, JOSEPH B., plant manager, Independent Oil Co., Rosslyn, Va.
BERGER, EVELYN, secretary to Washington manager, Lord Baltimore Filling Stations (Inc.), 1614 K Street, Washington, D. C.
BLAIR, C. E., purchasing department, Sun Oil Co., Philadelphia, Pa.
BOHART, J. G., Sinclair Refining Co., 45 Nassau Street, New York, N. Y.
BOWLING, EDWARD E., 5209 Norwood Avenue, Baltimore, Md.
CLARK, W. G., chief lubricating engineer, The Pure Oil Co., 35 East Wacker Drive, Chicago, Ill.
EATON, A. K., purchasing agent, Shell Eastern Petroleum Products (Inc.), 50 West Fiftieth Street, New York, N. Y.
EHLERS, C. H., chief engineer, The Atlantic Refining Co., 260 South Broad Street, Philadelphia, Pa.
FITZPATRICK, EDWARD I., Munsey Building, Washington, D. C.
FOX, RALPH, mechanic, Consolidation Coal Co., Monongah, W. Va.
GRISWOLD, A. G., Crew Levick Co., Rosslyn, Va.
GUNDLACH, O. H., Sinclair Refining Co., 45 Nassau Street, New York, N. Y.
HANNA, J. P., assistant district manager, Sinclair Refining Co., 205 East Forty-second Street, New York, N. Y.
HARGEN, S., engineer, Socony Vacuum Oil Co. (Inc.), 26 Broadway, New York, N. Y.
HAYES, E. A., Washington manager, Lord Baltimore Filling Stations (Inc.), 1614 K Street, Washington, D. C.
MCCABE, GEORGE P., 705 Security Building, Washington, D. C.
O'CONNELL, T. J., chief engineer, American Oil Co., American Building, Baltimore, Md.
WAKEFIELD, A., general superintendent, American Oil Co., Baltimore, Md.
WOODWARD, C. P., equipment engineer, Shell Petroleum Corporation, St. Louis, Mo.

GUESTS REPRESENTING RAILROADS

EPRIGHT, A. W., supervisor scales and weighing, Pennsylvania Railroad, Altoona, Pa.
LAWRENCE, E. KENT, general scale inspector, Baltimore & Ohio Railroad, Baltimore, Md.
PHERIGO, J. L., chief scale inspector, Southern Railway, Washington, D. C.
PROPST, H. C., chief scale inspector, Chesapeake & Ohio Railway, Richmond, Va.

GUESTS REPRESENTING GOVERNMENT DEPARTMENTS

CAREY, L. C., specialist in package standardization, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.
FRISBIE, W. S., chief, division of State cooperation, Food and Drug Administration, United States Department of Agriculture, Washington, D. C.
GAST, FRED W., chief, division of engineering and weighing, Bureau of Customs, Treasury Department, Washington, D. C.
MILLER, J. C., skilled draftsman, Post Office Department, Washington, D. C.

OTHER GUESTS

JACOBS, EDITH G., secretary, Scale Journal Publishing Co., 7152 Ridgeland Avenue, Chicago, Ill.
ORR, FRANK F., Newark, Ohio.
SMITH, EDWIN C., 145 Nassau Avenue, Huntington, N. Y.

Digitized by Google

CONTENTS

	Page.
Officers and committees	III
Persons attending the Conference	V
FIRST SESSION—MORNING OF TUESDAY, JUNE 4, 1935	
Opening address by E. C. Crittenden, Assistant Director, National Bureau of Standards	1
Appointment of temporary chairman	5
Abstracts of State reports:	
Arizona, Seth L. Lightfoot	5
California, C. E. Tucker	5
Connecticut, Walter F. Stiles	5
District of Columbia	6
Florida, N. Berryman	6
Georgia, S. H. Wilson	6
Illinois, John J. Levitt	6
Chicago, Ill., James O'Keefe	6
Indiana, Martin L. Lang	6
Kentucky, William H. Ising, Jr	7
Maine, John H. Austin	7
Maryland, S. T. Griffith	7
Massachusetts, John P. McBride	7
Michigan, George S. Barnard	7
Missouri, Louis G. Waldman	8
New Hampshire, Walter G. White	8
Announcements	8
SECOND SESSION—AFTERNOON OF TUESDAY, JUNE 4, 1935	
Abstracts of State reports—Continued:	
New Jersey, Joseph G. Rogers	9
New York, Alexander Hamilton	9
North Carolina, C. D. Baucom	9
Ohio, J. C. Tinkey	9
Pennsylvania, Urban E. Dice	10
Vermont, H. N. Davis	10
Virginia, J. H. Meek	10
West Virginia, P. J. Pellegrini	10
Wisconsin, William F. Steinel	10
Wyoming, Arling Gardner	11
Abstracts of reports of representatives of State associations of weights and measures officials:	
Indiana Association of Inspectors of Weights and Measures, Rollin E. Meek	11
Maine State Sealers' Association, James A. Boyle	11
Massachusetts Association of Sealers of Weights and Measures, E. M. Beebe	11
Michigan Association of Weights and Measures Officials, Irving G. Wheeler	11
New Jersey Weights and Measures Association, Joseph G. Rogers	12
Ohio Sealers Association, C. R. McFadden	12
Election of presiding officer for 1935 meeting	12
Report of Committee on Specifications and Tolerances on specifications, tolerances, and regulations for person weighers, presented by F. S. Holbrook, chairman	13
Discussion of above report	13

Digitized by Google

THIRD SESSION—MORNING OF WEDNESDAY, JUNE 5, 1935

Page

Announcement, and appointment of special committee on resolutions---- 23
Federal specification AAA-S-121 for weighing scales, by Ralph W. Smith, National Bureau of Standards---- 23
Discussion of report on specifications, tolerances, and regulations for person weighers—Continued---- 33
Supervision over the buying of old gold, by Elliott B. Holton, assistant superintendent of weights and measures, State of New Jersey---- 36
A study of the promulgation of rules and regulations as applied to the various States of the Union, by C. D. Baucom, superintendent of weights and measures, department of agriculture, State of North Carolina---- 38
The labeling and certification plan in connection with Federal specifications, by A. S. McAllister, Assistant Director, National Bureau of Standards---- 42
Demonstrations of recent developments in weighing scales, by representatives of manufacturers---- 46
Appointment of committees---- 46
Announcements---- 47

FOURTH SESSION—AFTERNOON OF WEDNESDAY, JUNE 5, 1935

Tour of the laboratories of the National Bureau of Standards---- 48

FIFTH SESSION—MORNING OF THURSDAY, JUNE 6, 1935

Reconsideration of adoption of specification 9 for person weighers---- 49
Demonstrations of recent developments in weighing scales, by representatives of manufacturers—Continued---- 50
Nontax-paid gasoline, by S. H. Wilson, oil chemist, State of Georgia---- 50
Report of special committee on resolutions, presented by Walter G. White---- 53
Temperature of gasoline in underground storage, by B. W. Ragland, chief, bureau of weights and measures, Richmond, Va---- 54
Gasoline losses in storage and handling, by H. C. Dickinson, National Bureau of Standards---- 55
Report of Committee on Specifications and Tolerances on modification of several codes, presented by F. S. Holbrook, chairman---- 59
Address by Hon. John Dickinson, Assistant Secretary of Commerce---- 61
Weights and measures and petroleum products, by D. V. Stroop, secretary, division of marketing, American Petroleum Institute---- 62
Sealed cans for dispensing lubricating oil, by Martin L. Lang, commissioner of weights and measures, State of Indiana---- 65
Discussion of above paper---- 69
Report of Committee on Specifications and Tolerances on modification of code for vehicle tanks, presented by F. S. Holbrook, chairman---- 70
Discussion of above report---- 74

SIXTH SESSION—AFTERNOON OF THURSDAY, JUNE 6, 1935

Discussion of report of Committee on Specifications and Tolerances on modification of code for vehicle tanks—Continued---- 76
Announcements---- 82
Demonstrations of recent developments in liquid-measuring devices, by representatives of manufacturers---- 82
Report of Committee on Specifications and Tolerances on modification of code for liquid-measuring devices, presented by F. S. Holbrook, chairman---- 82
Discussion of above report---- 83
Motor-truck scales and National Scale Men's Association activities, by M. J. J. Harrison, chairman, committee on yards and terminals, American Railway Engineering Association---- 88
A board of adjustment, by Edwin C. Emhardt, supervisor, bureau of weights and measures, Philadelphia County, Pa---- 95

Digitized by Google

SEVENTH SESSION—MORNING OF FRIDAY, JUNE 7, 1935

Page
Report of Committee on Specifications and Tolerances on modification of several codes—Continued 99
Reconsideration of adoption of specification 16 for liquid-measuring devices, as amended 101
Report of Committee on Specifications and Tolerances on modification of several codes—Continued 103
Resolution conferring authority to make certain revisions in codes of specifications and tolerances 107
The Byrd bill to consolidate Federal standard-container legislation, by L. C. Carey, specialist in package standardization, Bureau of Agricultural Economics, United States Department of Agriculture 107
Testing equipment for large-capacity scales 110
Paper of Jacob M. Vanderslice, district supervisor, bureau of weights and measures, Philadelphia County, Pa 110
The testing of beer barrels, by Willard E. Reed, superintendent of weights and measures, Newark, N. J 113
Discussion of above paper 117
The weights and measures provisions of the Copeland bill to revise the Federal Food and Drugs Act, by W. S. Frisbie, chief, division of State cooperation, Food and Drug Administration, United States Department of Agriculture 119
The Annual Assay Commission, by H. W. Bearce, National Bureau of Standards 122
Report of committee on nominations, and election of officers 128
The control of "bootleg" coal, by S. T. Griffith, chief, division of weights and measures, Baltimore, Md 129
Side beams, hidden weights, and dial scales, by J. C. Tinkey, deputy State sealer, State of Ohio 134
Discussion of above paper 138
Undercover buying as an aid to law enforcement, by George M. Roberts, superintendent of weights, measures, and markets, District of Columbia 138
Report of committee on resolutions, presented by C. D. Baucom, chairman:
In memory of Dr. Samuel W. Stratton 141
In memory of Dr. George K. Burgess 141
In memory of our departed brothers 141
Appreciation to officials cooperating 141
Appreciation to the Director and staff of the National Bureau of Standards 142
Appreciation to the Press 142
In relation to rules of procedure for the National Conference 142
Discussion of above report 143
Creation of committee on constitution and bylaws 144
Report of the treasurer, George F. Austin, Jr 144
Consideration of hotel headquarters for the Twenty-Sixth National Conference 144
Motion in relation to expenditures 145
Tribute to John H. Austin 145

Digitized by Google

Digitized by Google

Digitized by Google



Official photograph of delegates and guests attending the Twenty-fifth National Conference on Weights and Measures, assembled at the entrance of the East Building, National Bureau of Standards.

Digitized by Google

REPORT OF THE TWENTY-FIFTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

HELD AT THE NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C., June 4–7, 1935

FIRST SESSION—MORNING OF TUESDAY, JUNE 4, 1935

(The Conference was called to order at 11:12 a. m., by F. S. Holbrook, secretary of the Conference.)

Mr. HOLBROOK. Ladies and gentlemen, delegates, and guests of the Twenty-Fifth National Conference on Weights and Measures, in the absence of higher officers of the Conference, it becomes my duty, as secretary of the Conference, to call this meeting to order.

Since the last meeting we have suffered a very great loss by the untimely death of Dr. George K. Burgess, then Director of the National Bureau of Standards and President of the Conference.

Both of our vice presidents, selected at the last meeting, have retired from weights and measures work.

In such a situation, as I have said, it becomes necessary for the secretary to call the meeting to order. At the conclusion of the first number on the program, I will call one of your number to preside over this session. Early this afternoon you will be asked to select a presiding officer for the 1935 meeting. The election of permanent officers for the ensuing year will take its usual place on our program.

This, as you know, is the first meeting of the Conference since 1931 and the outlook is for a very fine meeting this year.

Dr. Lyman J. Briggs, the Director of the National Bureau of Standards, was very much disappointed at finding it necessary to be out of town on official business. In his absence Mr. E. C. Crittenden, Assistant Director of the Bureau, will make the opening address to this Conference.

I take pleasure in introducing Mr. Crittenden.

OPENING ADDRESS

By E. C. CRITTENDEN, *Assistant Director, National Bureau of Standards*

Gentlemen, it is a special pleasure to welcome here again the members of the National Conference on Weights and Measures. To you who have taken part in past Conferences we extend a welcome such as is due to old friends returning after 4 years of absence. The new members also we welcome no less cordially, in the confidence that this Conference and those to come will continue to bring about the friendships and the mutual understanding which have flowed from former meetings and which help us all to do our work better.

34678—36——2

Digitized by Google

Our pleasure in seeing you here again is, however, alloyed with some regrets as we look back over the changes which 4 years have wrought. Many faithful old members are not here today, and the vacancies in your list of officers bear mute testimony to the ravages of time and change.

Dr. Samuel Wesley Stratton, who served as your president for so many years, died suddenly at the Massachusetts Institute of Technology on October 18, 1931, a few months after the last Conference. Dr. George Kimball Burgess, who succeeded Dr. Stratton in the presidency at the Sixteenth Annual Conference in 1923, followed him in death by only a few months. Dr. Burgess was stricken with a cerebral hemorrhage in October 1931. He recovered sufficiently to return to duty as Director of this Bureau, but suffered a second attack in his office on July 2, 1932, and died on his way from the Bureau to the hospital.

As a summary of Dr. Burgess' career, I cannot do better than to read a brief biographical note prepared by our present Director, Dr. Briggs.

GEORGE KIMBALL BURGESS

Dr. Burgess was born in Newton, Mass., January 4, 1874, and was a direct descendant of Thomas Burgess, of England, who settled in Sandwich, Mass., in 1638. He was educated in the public schools of Newton and later entered the Massachusetts Institute of Technology, where he graduated in 1896. Most graduate students of that period who were able to continue their studies abroad went either to Germany or England, but Burgess decided to study at the Sorbonne. This decision had a profound influence upon his later work. In Paris he became deeply interested in high temperature measurements under the guidance of Le Chatelier, and later translated Le Chatelier's book on this subject. Here he acquired a fluent use of the French language, which later was to prove of great service to him in important international conferences. Here also he met Mlle. Suzanne Babut, whom he married in 1902, and who survives him.

Following the award of his doctorate from the Sorbonne in 1901 with highest honors, Dr. Burgess joined the physics staff of the University of Michigan, and the following year was called to the University of California. In 1903 he entered the service of the National Bureau of Standards, 2 years after its organization, and began a series of notable researches in the field of pyrometry, in large part in collaboration with Dr. C. W. Waidner. These investigations included an extended study of optical pyrometry, platinum resistance thermometry at high temperatures, the determination of the melting points of pure metals, and the study of the selective radiation from incandescent bodies.

It was during this period (1908) that Waidner and Burgess proposed as an absolute standard of brightness the radiation from the interior of a black body immersed in a bath of pure platinum at its freezing point. Lack of suitable refractories made it impossible to carry out the experimental procedure at that time, but 20 years later as Director of the National Bureau of Standards, Dr. Burgess had the keen satisfaction of seeing the Waidner-Burgess standard experimentally realized by members of the Bureau staff.

His interest in the properties of materials at high temperatures led him into the field of physical metallurgy, and in 1913 he was made chief of the newly organized Metallurgical Division of the Bureau. This marks the second stage of his career. He took up this work with characteristic energy and enthusiasm,

Digitized by Google

and in the course of its development he demonstrated his marked ability as a technical executive. While directing this work, he still found time for his own researches on the causes of dangerous defects in railway materials. He demonstrated the practicability of measuring the temperature of steel rails as they pass through the rolls in the mill, which provides an important control as regards uniformity and quality. He also contributed to the development of an improved method for producing steel ingots from which sound rails could be rolled. His investigations have contributed materially to the safety of railway travel.

When Dr. Stratton closed his distinguished career at the Bureau in 1923 by his decision to accept the presidency of the Massachusetts Institute of Technology, Dr. Burgess was appointed his successor as Director of the National Bureau of Standards. This selection met with the whole-hearted approval of the Bureau staff. The progressive development of the work of the Bureau during the past 8 years under his direction bears witness to his wise administration. He was active in the development and final adoption of an international temperature scale and in support of the international program now under way to establish the electrical units in absolute measure. Through the research associate plan he developed industrial research at the Bureau in cooperation with industry and technical organizations. During the last year of his administration the new national hydraulic laboratory was completed and extensive facilities were provided for the study of radio wave phenomena.

His office door was always open. Interruptions did not seem to worry him. His visitor found him dignified, but friendly, alert, attentive. He reached decisions promptly. His voice was low, his sentences crisp. His sense of humor was keen, and he responded to it with quiet body-shaking laughter. Sedentary in his habits, he had little interest in sports and games. Recreation to him meant a good book and a plentiful supply of tobacco, or a long drive in an open car with a friend. He loved the sea, and a long cruise was for him an ideal vacation.

Dr. Burgess gave generously of his time and energy to further the interests of organizations engaged in the advancement of research and standardization. At the time of his death he was president of the National Conference on Weights and Measures, chairman of the Federal Specifications Board, the National Screw Thread Commission, and the Federal Fire Council, a director of the American Standards Association, and a member of the National Advisory Committee for Aeronautics. His term of office as chairman of the National Reserach Council expired on June 30. He was a past president of the American Society for Steel Treating, the Philosophical Society of Washington, the Washington Academy of Sciences, the American Society for Testing Materials, and the Cosmos Club. He was a member of the National Academy of Sciences (past treasurer), the American Institute of Mining and Metallurgical Engineers, the Optical Society of America, the American Institute of Metals, the Physical Society of France, the Iron and Steel Institute of Great Britain, and a fellow of the American Physical Society and the American Association for the Advancement of Science. Case and Lehigh had honored him with the degree of doctor of engineering.

His memory will be cherished by the staff of the organization to which he gave the greater part of his life, and by his numerous friends in scientific and industrial circles, not alone in America but throughout the world.

The National Bureau of Standards has been remarkably fortunate in having at its head through 31 years of its development two men of such outstanding ability as Dr. Stratton and Dr. Burgess.

Digitized by Google

Fortunately also, the administration has continued the policy of naming as Director a man whose reputation is based upon fundamental scientific work. We are doubly fortunate in having another Director whose sound judgment and quick human sympathy command the affection as well as the respect of the whole staff. We are sorry indeed that Dr. Briggs cannot be here during your meeting this year. He wishes me to express his whole-hearted regret at his necessary absence and to give you his wishes for a most successful meeting. He has sent me a letter addressed to the National Conference on Weights and Measures, which I will read to you.

THE NATIONAL CONFERENCE ON WEIGHTS AND MEASURES,
c/o The National Bureau of Standards,
Washington, D. C.

GENTLEMEN: I deeply regret that circumstances beyond my control make it impracticable for me to be at the National Bureau of Standards to welcome you on the occasion of your 1935 meeting. I regret my absence the more keenly because of the fact that no Conference has been held during the past 3 years. The members of the Bureau staff have greatly missed the valuable contacts which these meetings provide, and I hope that from now on your Conference may be held annually without interruption.

It is our desire also to supplement these contacts as far as possible through personal visits by our staff to the various States to meet the officials charged with the enforcement of weights and measures regulations.

In turn I trust that you will not fail to avail yourselves of any opportunity to visit the National Bureau of Standards.

From these closer contacts will result a better understanding of our mutual problems, which is an important step toward the ultimate goal of uniform regulations.

Sincerely yours,

(Signed) LYMAN J. BRIGGS,
Director.

As Dr. Briggs states in his letter, he looks for uniformity in weights and measures regulations. However, we feel this meeting, this conference of yours, presents an example of a way that might well be extended beyond the field of weights and measures, and that is to set up an ideal relationship between the Federal Government and State and local officials. Of course, we all know at this time what functions the National Conference plays in relation to our affairs. Some of our very distinguished officials differ with others as to what may be correct or what may not be correct, but all feel it desirable that they cooperate. The result is mutual assistance and mutual benefit in carrying out the functions which are divided between you and the Federal Government in such a way as to make them more effective. We hope, as Dr. Briggs has suggested, that this cooperation be continued and grow better as the years pass.

Your program discloses that this is the Twenty-fifth National Conference. It thus may well be a jubilee Conference. We trust, therefore, that you will find some time for relaxation and enjoyment as well as serious work during your stay in Washington.

A study of the 4-year interval will present some of the problems arising during that time. You still have to deal with such old problems as the sale of oil and gasoline and other commodities. I note, however, that on the final day of your program you have to deal with the subjects of beer barrels and bootleg coal. This is quite different from 4 years ago, when it was the former rather than the latter commodity which was the subject of "bootlegging."

Digitized by Google

On Wednesday you are scheduled to make a trip through the Bureau, and at that time there will be guides placed at your disposal.

Finally, I note particularly your closing item, the suggestions for the program of the Twenty-sixth National Conference. We shall look forward to seeing you here again next year, and trust that these conferences will be as successful during the next 25 years as they have been during the last 25.

In closing, I wish to emphasize Dr. Briggs' invitation to call on us and send us your questions at any time. We are at your service not only during the Conference, but throughout the year. Please feel sure that whatever we can do for you will be done with real pleasure. I thank you very much for your attention.

Mr. HOLBROOK. Thank you, Mr. Crittenden.

APPOINTMENT OF TEMPORARY CHAIRMAN

Mr. HOLBROOK. I am going to ask Mr. John P. McBride, director of standards of Massachusetts, to take charge of the meeting until this afternoon, when a presiding officer can be elected. Mr. McBride.

(At this point Mr. McBride assumed the chair, as temporary chairman of the Conference.)

ABSTRACTS OF STATE REPORTS[1]

ARIZONA

By SETH L. LIGHTFOOT, *State Inspector of Weights and Measures*

Mr. Lightfoot reported that in several jurisdictions in his State there were local sealers of weights and measures and that the State official took charge of testing elsewhere. He gave figures showing the number of pieces of equipment inspected, tested, and condemned by the various local sealers and by the State department during 1933 and 1934.

CALIFORNIA[2]

By C. E. TUCKER, *Chief, State Division of Weights and Measures*

Mr. Tucker reported the growth of weights and measures work despite depressed conditions, and the harmonious conditions existing throughout the organization in the State. He also reported that the most important recent legislation enacted affecting the State department, was, that it had been made subject to civil service.

CONNECTICUT

By WALTER F. STILES, *Captain of State Police*

Mr. Stiles reported the passage of several laws strengthening weights and measures administration in the State; one changed the contents of the standard barrel from 31½ gallons to 31 gallons, to comply with the beer barrel adopted for Federal taxation purposes; other laws were in relation to the sale of gold by weight, and to the sale of gasoline and oils. A bill introduced to define a standard cord of wood failed of enactment.

[1] For convenience of reference these reports have been arranged in alphabetical order throughout.
[2] Submitted by mail and presented to the Conference by the secretary.

Digitized by Google

DISTRICT OF COLUMBIA

(Mr. George M. Roberts, superintendent of weights, measures, and markets, District of Columbia, was not present at the meeting when the report for the District was called for. Mr. Walter C. Diller, chief inspector, presented Mr. Roberts' regrets.)

FLORIDA

By N. BERRYMAN, *Assistant State Chemist*

Mr. Berryman reported that while the State had no weights and measures division, there was a growing interest in the subject. The only weights and measures work done by the State is the testing of gasoline pumps and the checking of the weight of food in package form. He reported activity on the part of some of the cities, but stated that the State had no official connection with this work.

GEORGIA

By S. H. WILSON, *State Oil Chemist*

Mr. Wilson reported that some changes had been made in the weights and measures law at the last session of the legislature, but stated that it was not being enforced, since no money had been appropriated for this purpose. The main weights and measures work being done by the State consisted in the testing of gasoline pumps once every 90 days; there were local officials in several of the cities.

ILLINOIS

By JOHN J. LEVITT, *State Superintendent of Standards*

Mr. Levitt reported upon the organization of the work in Illinois and the number of inspections made during the last year. He mentioned the problems involved in the coal-trucking situation and the steps taken to cope with this. He reported an increase in appropriation to purchase and operate equipment for the competent testing of large-capacity scales, and briefly described a survey indicating the necessity of such tests.

The TEMPORARY CHAIRMAN. Now, gentlemen, I pray your indulgence for just a momemt. We want to hear from Mr. O'Keefe, the city inspector of weights and measures of Chicago.

CHICAGO, ILLINOIS

By JAMES O'KEEFE, *City Inspector of Weights and Measures*

Mr. O'Keefe reported on the appropriations, tests, and prosecutions of the city department of weights and measures. He gave it as his opinion that calibration of capacities of vehicle tanks should be discontinued, and meters installed thereon. He also discussed the types of scales in use.

INDIANA

By MARTIN L. LANG, *State Commissioner of Weights and Measures*

Mr. Lang reported a steady gain in the number of inspections made. He described the operation and benefits resulting from the corn loan law, which was administered by the State bureau of weights and measures, and also cited several other laws passed during the

Digitized by Google

last 4 years. He reported that an additional unit for the testing of large-capacity scales was shortly to be purchased and put into service.

KENTUCKY

By WILLIAM H. ISING, Jr., *Chief Inspector of Weights and Measures, of Louisville*

Mr. Ising stated that he was not prepared to make a report for the State, but reported that in the city of Louisville some trouble had been encountered in the regulation of the sale of coal brought in direct from the mine by truck, and that this matter was receiving special attention.

MAINE

By JOHN H. AUSTIN, *Deputy State Sealer of Weights and Measures*

Mr. Austin reported upon new legislation recently adopted in the State, which included an act granting the right to manufacturers of milk bottles and oil cans to seal their product, with the right of test reserved to the officials, an act requiring the delivery of weight tickets with deliveries of coal; and an act granting the power to the State commissioner to make rules and regulations defining weights and measures.

MARYLAND

By S. T. GRIFFITH, *Chief, Division of Weights and Measures, of Baltimore*

Mr. Griffith reported that while the State had a general weights and measures law there was no State department of weights and measures to enforce it and that few of the counties had sealers; he described the efforts being made to rectify this condition, and cited several amendments recently made in the State law. He stated that the city of Baltimore had a thorough organization and discussed some of the problems recently arising.

MASSACHUSETTS

By JOHN P. MCBRIDE, *Director, State Division of Standards*

Mr. McBride reported the procurement of new special apparatus, including portable equipment necessary for the proper test of vehicle tanks and a truck with power-operated crane for the adequate test of large-capacity scales. He also reported on the steps taken to cope with problems recently arising in connection with the sale of beer in barrels, of foodstuffs by the unit instead of by weight, and of fuel oil.

MICHIGAN

By GEO. S. BARNARD, *Director, State Bureau of Foods and Standards*

Mr. Barnard reported on the organization of the inspection service and the cooperation between the State and local departments, giving statistics of work accomplished since the last Conference. He described the operation of special equipments designed for the test of large-capacity scales, and the plans being made for a special equipment for follow-up tests so that more of these tests could be accomplished.

Digitized by Google

MISSOURI

By LOUIS G. WALDMAN, *Commissioner of Weights and Measures, of St. Louis*

Mr. Waldman reported that there was no State department of weights and measures but there were departments in a number of the larger cities. In St. Louis it was necessary strictly to regulate the very large amount of coal brought into the city direct from Illinois mines by truck, and the city received considerable revenue from this activity. He also noted new equipment installed for the test of vehicle tanks.

NEW HAMPSHIRE

By WALTER G. WHITE, *State Commissioner of Weights and Measures*

Mr. White reported difficulty experienced in the regulation of the increasing number of itinerant vendors selling by weight or measure; an effort to secure legislation involving registration, to deal with this class, had been unsuccessful. He reported, however, the passage of legislation requiring that all scales be located in full view of the customer, and mentioned a contemplated change in the law, requiring all commodities in package form to be marked with the correct net contents.

ANNOUNCEMENTS

(At this point announcements were made by the secretary that copies of the report of the committee on specifications and tolerances on person weighers were available for distribution; also the details of a radio broadcast by members of the Conference, on Tuesday evening, were given.)

(At this point, at 12:58 p. m., the Conference took a recess until 2 p. m.)

Digitized by Google

SECOND SESSION—AFTERNOON OF TUESDAY, JUNE 4, 1935

(The Conference reassembled at 2:14 p. m., John P. McBride, temporary chairman, in the chair.)

ABSTRACTS OF STATE REPORTS—Continued

NEW JERSEY

By JOSEPH G. ROGERS, *Assistant State Superintendent of Weights and Measures*

Mr. Rogers reported on legislation and methods adopted to regulate the increasing number of coal deliveries being made direct from the mines by truck, on a new regulation for the sale of commodities by weight, and on developments resulting from the operation of codes, especially the petroleum code. He stated that as a result of depressed conditions, condemnations and prosecutions were on the increase. He also noted revival of interest in standard bread-weight legislation.

NEW YORK

By ALEXANDER HAMILTON, *Deputy Commissioner, Department of Public Markets, Weights, and Measures, New York City*

Mr. Hamilton stated that he was not prepared to report for the State, but reported that in New York City the mayor's bureau of weights and measures had been consolidated with the department of public markets. He described methods which had been adopted for raising revenue, especially the operation of a law requiring the registration of dealers in coal and licensing of weighmasters. He stated that as a result an adequate equipment for the test of large-capacity scales would shortly be procured.

NORTH CAROLINA

By C. D. BAUCOM, *State Superintendent of Weights and Measures*

Mr. Baucom reported operations under the approval-of-type law, stating that of some 3,000 types of devices submitted, more than 1,000 had failed of approval. He mentioned that the calibration of tank trucks having large capacities was the most difficult feature of his work; that six new rules and regulations had been promulgated; and that a severe cut in appropriations made in 1933 had been partially restored.

OHIO

By J. C. TINKEY, *Deputy State Sealer*

Mr. Tinkey reported the issuance of a new book of instructions to sealers based on the specifications of the conference, but containing some additions, and urged uniformity of requirements throughout the country. He mentioned some features of the work which were in need of additional supervision and discussed the legislative program to strengthen the weights and measures laws, but stated that little has been accomplished in this connection.

Digitized by Google

PENNSYLVANIA

By URBAN E. DICE, *County Sealer of Weights and Measures, Allegheny County*

Mr. Dice reported that in the city of Pittsburgh the weights and measures department had been merged with the health department, that the county authorities now made tests in the city, but that the personnel of the department was inadequate for the work. He discussed a new coal law designed to regulate coal brought in from the mines by truck. He also reported that a new equipment for the test of large-capacity scales had just been put into use.

VERMONT

By H. N. DAVIS, *Deputy State Commissioner of Weights and Measures*

Mr. Davis reported that in Vermont weights and measures work was handled entirely by the State and that there had been great need of intensive work during the depression, but stated that he thought weights and measures conditions were better than formerly. He also reported the procurement of a new testing outfit for the calibration of vehicle tanks and for testing meters on tanks and at bulk plants, this replacing one the accuracy of which had been occasionally questioned.

VIRGINIA

By J. H. MEEK, *Director, State Division of Markets*

Mr. Meek reported that the work in the State had recently been extended, an increased number of jurisdictions now having weights and measures officials. He stated that the State law had been improved by amendments and that it was now similar to the model law; and that the State now tested large-capacity scales and gasoline devices in jurisdictions not having officials or lacking proper testing equipment, and also did general testing work for counties providing financial assistance.

WEST VIRGINIA

By P. J. PELLEGRINI, *State Inspector of Weights and Measures*

Mr. Pellegrini reported on the provisions of the weights and measures laws of the State and the manner in which these were being enforced. He noted an increased number of inspections made by the State department and a considerable increase in the number of pieces seized, and condemned for repair; also a special effort to prevent the sale of short-weight package goods. He stated that in the last 2 years the number of county sealers had decreased from 18 to 5.

WISCONSIN

By WILLIAM F. STEINEL, *Sealer of Weights and Measures, Milwaukee*

Mr. Steinel reported that the Supreme Court of the State had handed down a decision that wrapped bread was not a container; therefore the attempt made to break down the standard-weight loaf provision by marking the weight on the wrapper of nonstandard-size loaves had been rendered unsuccessful. He described several activities outside the field of weights and measures which had been assigned to the department of weights and measures.

Digitized by Google

WYOMING [4]

By ARLING GARDNER, *Deputy Commissioner of Agriculture*

Mr. Gardner reported on the enforcement of the weights and measures law, stating that some types of devices were regularly tested twice a year; however, others, such as coal scales and vehicle tanks, were tested only upon request, while still others, including most large-capacity scales, were not tested at all on account of lack of personnel and equipment, a condition in need of remedy. He noted that products sold by weight and measure were systematically checked.

ABSTRACTS OF REPORTS OF REPRESENTATIVES OF STATE ASSOCIATIONS OF WEIGHTS AND MEASURES OFFICIALS [5]

INDIANA ASSOCIATION OF INSPECTORS OF WEIGHTS AND MEASURES

By ROLLIN E. MEEK, *Chief State Inspector of Weights and Measures*

Mr. Meek reported, as president of the association, that the association had just held its twenty-third annual conference, and mentioned some of the features of the meeting. He stated that it cooperated to the fullest extent with the State bureau and that this cooperation had resulted in better weights and measures administration.

MAINE STATE SEALERS' ASSOCIATION

By JAMES A. BOYLE, *Sealer of Weights and Measures, Portland*

Mr. Boyle reported, as secretary of the association, on the legislative program and the administration of weights and measures in the State. He reported the passage of one law authorizing the State sealer to promulgate rules and regulations. He described the apparatus and methods employed in the test of vehicle tanks, and advocated publicity in connection with prosecutions for violations of law.

MASSACHUSETTS ASSOCIATION OF SEALERS OF WEIGHTS AND MEASURES

By E. M. BEEBE, *Deputy Sealer of Weights and Measures, Springfield*

Mr. Beebe reported, as official delegate to the National Conference, that the State association was formed in 1926, and now had a membership of 365. He stated that the association was a strong advocate of civil service, and also interested itself in improvement of the State law, being influential with the legislature in this regard. He discussed the provisions of some new laws and regulations. He paid a tribute to Mr. Fred E. Marsh, sealer of Ware, who is serving his fiftieth year in office.

MICHIGAN ASSOCIATION OF WEIGHTS AND MEASURES OFFICIALS

By IRVING G. WHEELER, *Sealer of Weights and Measures, Jackson County*

Mr. Wheeler reported, as president of the association, that the association was sponsoring a survey of the standards and weights and measures conditions in the State, and it was hoped that this project would shortly be completed. It was believed that the facts developed in this survey would result in securing a greater uniformity in the solution of weights and measures problems arising.

[4] Submitted by mail and presented to the Conference by the secretary.
[5] For convenience of reference these reports have been arranged in alphabetical order.

Digitized by Google

NEW JERSEY WEIGHTS AND MEASURES ASSOCIATION

By JOSEPH G. ROGERS, *Assistant State Superintendent of Weights and Measures*

Mr. Rogers reported, as secretary of the association, that during the period that the National Conference suspended its meetings the State association also suspended its regular annual conferences and substituted a 1-day meeting each year. He stated that this year a 2-day meeting would be held; thereafter it was expected that the regular conferences would be resumed.

OHIO SEALERS' ASSOCIATION

By C. R. MCFADDEN, *Sealer of Weights and Measures, Licking County*

Mr. McFadden, as president of the association, reported the manner in which the association functioned; one general annual meeting is held, and in addition district meetings are held in various parts of the State, particular attention being given to the instruction of new sealers; recently a large number of officials have been appointed. He stated that great improvement of conditions had been made, at small cost to the public.

(At this point, Mr. B. W. Ragland, chief, bureau of weights and measures, Richmond, Va., and Mr. Howard E. Crawford, inspector of weights and measures, Jacksonville, Fla., were called upon and spoke briefly in relation to conditions in their jurisdictions.)

Mr. BUNDENTHAL. Mr. Chairman, no action has been taken on a very splendid suggestion made by Mr. Beebe. I refer to his remarks concerning the weights and measures official who just completed 50 years of activity as a weights and measures worker, Mr. Fred E. Marsh, of Ware, Mass. I think that record is due some recognition by this National Conference. I move that the secretary be instructed to write a letter expressing the felicitations of the Conference upon his splendid service.

(The motion was seconded, the question was taken, and the motion was agreed to.)

ELECTION OF PRESIDING OFFICER FOR 1935 MEETING

The TEMPORARY CHAIRMAN. We will now proceed to the first order of the afternoon session, item 5 on the program, the election of a presiding officer for the 1935 meeting. Your choice will continue, where I now leave off, for the balance of the Conference.

Mr. WALDMAN. I nominate Mr. McBride, of Massachusetts, our temporary chairman, as presiding officer for the 1935 meeting.

(At this point the secretary assumed the chair.)
(The nomination was seconded.)

The ACTING CHAIRMAN. Are there any other nominations?

(It was moved and seconded that the nominations be closed, and that the secretary be directed to cast the ballot of the Conference for the nominee for presiding officer for the 1935 meeting.)
(Accordingly, the secretary cast the ballot of the Conference for the presiding officer for the 1935 meeting, as nominated, and he was declared duly elected.)
(At this point, Mr. John P. McBride resumed the chair.)

The CHAIRMAN. Thank you, gentlemen.

At this point on the program, it was intended that representatives of manufacturers of person weighers should demonstrate their products to the Conference. In relation to this item, I may state that all

Digitized by Google

known manufacturers of these devices were invited to exhibit but none have taken advantage of this invitation.

In the lack of exhibits, the representatives of manufacturers of person weighers will be given a brief opportunity to address the Conference in relation to person weighers. We would like to hear general statements as to how the inspection of person weighers under the code of specifications and tolerances proposed would affect the various products.

(SECRETARY'S NOTE.—In response to the above invitation, Mr. W. G. Fitzgerald addressed the Conference. Since his remarks referred wholly to specification 9, for person weighers, they have been included later in the report when this specification came up for general discussion.)

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON SPECIFICATIONS, TOLERANCES, AND REGULATIONS FOR PERSON WEIGHERS, PRESENTED BY F. S. HOLBROOK, CHAIRMAN

Mr. Chairman and gentlemen, your committee on specifications and tolerances has given consideration to the code of specifications, tolerances, and regulations for person weighers, which was tentatively adopted by the twenty-fourth national conference in 1931. At the time of its tentative adoption it was presumed that it would come up for action before this body in 1932. However, due to the cancelation of several conferences, its further consideration has now been postponed for 3 years. During this period it has continued to remain in a tentative status, insofar as the National Conference on Weights and Measures and the National Bureau of Standards are concerned.

Your committee now recommends several changes in the code, and also makes recommendations in regard to the paragraphs of the specifications which it is believed should be retroactive and nonretroactive, respectively. In the mimeographed code, underlining indicates nonretroactive material.[6]

Your committee recommends that specifications 3 and 11 of the tentative code for person weighers as adopted in 1931, be amended in the manner which will be pointed out; that a new specification to be numbered 8 be added; and that specifications 2 and 5 be made nonretroactive.

Respectfully submitted.

(Signed) F. S. HOLBROOK, *Chairman*,
JOSEPH G. ROGERS,
JOHN P. MCBRIDE,
GEO. F. AUSTIN, Jr.,
Committee on Specifications and Tolerances.

DISCUSSION OF ABOVE REPORT

Mr. HOLBROOK. The code will now be read, paragraph by paragraph. I hope you gentlemen will interrupt at any time when there is any question in your minds concerning any specification.

It may be well, at this time, to call attention to the fact that officials, manufacturers, or owners or users of these machines have the privilege

[6] Italic type is used herein to indicate nonretroactive material.

Digitized by Google

of the floor. However, it is the practice of the Conference that officials only shall vote on any question that arises. [Reading:]

NOTE.—The following specifications, tolerances, and regulations shall apply to person weighers in those cases in which they are used or to be used commercially—that is, when a charge is made for the weighing service—and such use shall be permitted only when the provisions of this code are complied with. Whenever noncommercial person weighers are inspected and tested by the weights and measures official, it is recommended that these be officially sealed only when they comply with these specifications and tolerances.

DEFINITIONS

A person weigher is a scale of any type which is specially designed for the weighing of persons. This definition is not to be construed to include scales specifically designed for the weighing of infants and children.

A "beam" person weigher is one in which weight indications are obtained by the manipulation of one or more beam poises.

An "automatic-indicating" person weigher is one in which weights are automatically indicated on a reading face of any type.

A "ticket" person weigher is one in which a representation of each individual weight is automatically made upon a ticket, card, etc., which is automatically delivered to a suitable receptacle on the outside of the scale.

SPECIFICATIONS

1. A person weigher shall have a capacity of not less than 250 pounds.

2. *A person weigher shall be so designed and constructed that it has a definite and clear zero graduation and gives a definite and clear indication of its zero balance condition at all times when ready for use. In the case of an automatic-indicating or ticket person weigher the zone throughout which the zero balance condition shall be indicated shall correspond to at least 5 pounds on each side of the zero graduation.*

I think it is only fair to call your attention, in the case of this specification, to the fact that it represents a departure from former conventional construction; this type of person weigher has come upon the market only in the last few years, largely, I think, as a result of this requirement. You will readily recognize that a great many machines now in use do not, at the present time, comply with that specification. For these reasons it is believed, that if the specification is adopted, it should be made nonretroactive.[7]

3. A person weigher shall be so designed and constructed that it is susceptible of giving weight indications at all points between zero and capacity: Provided, however, That a person weigher may have an interval between zero and some definite weight value throughout which weight values are not given, but in this case the person weigher shall be so designed and constructed that whenever the weight on the platform is such as to fall within this interval, any coin inserted will be returned to the user through automatic delivery to a suitable receptable on the outside of the person weigher, or the insertion of a coin in the coin slot will automatically be prevented.

The last clause is new. It is recommended that it be added to the specification at this time.

4. The maximum value of the minimum weight graduations on any person weigher shall be 1 pound.

5. *A person weigher whose weight indication is changed by an amount greater than one-half the tolerance allowed, when set in any position on a surface making an angle of 5 percent or approximately 3° with the horizontal, shall be equipped with a device which will indicate when the person weigher is level, and in no case shall any pendulum operating the person weigher be considered a leveling device. The person weigher shall be rebalanced at zero each time its position is altered during the test contemplated by this specification.*

6. All devices for adjusting the balance condition or the level of a person weigher shall be of such construction that they are operative or accessible only by the use

[7] For general discussion of this specification see p. 20.

Digitized by Google

of some tool or device which is outside of and entirely separate from the device in question, such as a screw driver, wrench, etc., but not an adjusting pin.

7. A person weigher which is liable to give incorrect results except when special precautions are observed shall have appropriate and explicit instructions conspicuously, clearly, and permanently marked upon it.

Mr. BAUCOM. Mr. Holbrook, is that necessary in there? Just for argument, if the thing doesn't do the work, why approve it at all? I haven't time to study it all, but my first reaction is that specification 7 is hardly needed.

Mr. HOLBROOK. Take the case of a ticket person weigher; this type of scale stamps a weight upon a card. If a person should drop his penny after he steps upon the scale, before the vibrating mechanism has come to rest, he may get an incorrect weight. A sign "Stand Still Before Depositing Coin", would seem reasonable and appropriate.

Mr. FITZGERALD. Mr. Chairman, we have a "delay coin shutter", so that the person can step on the scale and drop the coin, but the machine will not operate until the dial has come to rest. On that scale such instructions are not necessary.

Mr. HOLBROOK. I cited that as an example of the instruction that might be put on the scale.

8. *A person weigher shall be so designed and constructed as to facilitate the affixing by the weights and measures official of a condemning tag by means of a wire in such a way that the insertion of a coin in the coin slot will be prevented when the device is under condemnation.*

This is a paragraph recommended by the committee for addition to the code. The committee is of the opinion that persons desirous of obtaining their weight may be liable to overlook a condemning tag on a scale and use the scale in spite of this tag if the coin slot is still open for the reception of coins.

A very slight modification would be to have a coin slot with two drilled holes on either side opposite each other so that in affixing the condemning tag the inspector can draw his wire across the coin slot. This would be an unmistakable notice to the public that the scale was not in proper condition for use.

Mr. LOSEY. Could that specification be amended before we vote on this? We person-weigher men desire to know how the devices will be modified to accommodate the wire. Is the wire to be inserted during the time it is condemned until a man comes and makes repairs? In my community we have experienced considerable difficulty all the way between the time a machine was condemned and the time the repairman comes to make the proper adjustment.

Mr. HOLBROOK. As a committee we do not feel entitled to bring a new recommendation before this Conference this year, and move that it be retroactively adopted in relation to all machines which are on the streets at the present time. Some of these machines could be readily made to comply with this specification by the drilling of two holes. However, I am advised that this operation would damage the appearance of some machines. Again, the enamel might be broken and render that portion of the scale which had been drilled subject to rapid deterioration. We feel this is an excellent thing in general, but we are not prepared to recommend it for immediate enforcement against machines already sold and in use. We think it a reasonable requirement for scales hereafter produced by manufacturers.

Mr. RAGLAND. Couldn't it be amended to require that machines now out be taken back to their establishments for repair?

Digitized by Google

Mr. HOLBROOK. I think such a thing as that would normally be a local regulation. I do not know how such a thing could be handled as part of a Conference code. Something of that sort might be done, but that certainly would not be a requirement to be imposed upon the manufacturer, because the manufacturer has often disposed of these machines, and is no longer responsible. The owner is the man who would have to take care of any modification of that kind.

Mr. BAUCOM. Could we legally enforce such a requirement contrary to this adoption here today?

Mr. HOLBROOK. If you have powers to make local rules and regulations governing the use of devices, I presume that such a local requirement would stand in the courts.

Mr. ROGERS. Mr. Chairman, in the State of New Jersey local jurisdictions would never do that themselves. Such a regulation would have to come through the State superintendent of weights and measures.

Mr. DAVIS. Does this contemplate a place to insert the wire of a lead seal on the scale, or a condemnation tag?

Mr. HOLBROOK. This relates only to attaching a condemning tag. It has been suggested when an official tags a person-weigher scale as condemned, the public may go on using it, overlooking the condemning tag. You see, there is a difference between the ordinary commercial scale and the person weigher. When a commercial scale is condemned, it becomes illegal for the owner to use it, and if he does so, he is liable to punishment. However, when you have these person weighers out on location, the owners are not present. It is not the owner, but the public, who is the user. Therefore the ordinary penalty for the use of condemned equipment does not apply.

To meet this situation the method suggested would make it impossible for the public to overlook the condemning tag, since it would effectively prevent the insertion of the coin. It is very good notice that the device is not in condition for use.

Mr. DAVIS. My question was as to whether the manufacturer should provide a hole in that machine to facilitate the attachment of a seal or condemning tag. These scales have no place provided for this. It becomes necessary to stick on a paper sticker, and especially if a scale is outside exposed to rain or snow, it will not remain attached.

My thought was to have the scale so constructed that a place would be provided for wiring on a condemning tag or a lead seal.

Mr. HOLBROOK. That subject has been raised from time to time in the past, and it has been suggested that the various jurisdictions use so many different types of seals that it is difficult for the manufacturer to determine what character of seal is going to be used. He must know this if he is to make proper provision for it. As I recall it, many years ago, perhaps in 1913, Mr. Charles C. Neale, then of Minnesota, brought down a very elaborate collection of seals of various types and made recommendations for the adoption of a more or less uniform seal. He may have coupled with that a request that the manufacturers then provide a place to which that uniform seal could readily be attached, or affixed. However, the uniform seal never materialized, and the manufacturer is still in doubt as to what character of sealing means he should provide. At any rate, I think but few of the commercial machines on the market at the present time provide any special place or means for the attachment of a seal.

Digitized by Google

Mr. TINKEY. I believe there is one point that has been overlooked. Suppose you pass this regulation? I drive my car 20 to 200 miles in my trips, and I put a condemning tag on a person weigher. The next day the repairman of the manufacturer may come along. He cannot do any work on it before that condemning tag is off. He has got to call me back in order to take that tag off. If a customer puts a penny in a scale that is tagged as condemned, he ought to lose the penny. It looks to me to be superfluous.

Mr. HOLBROOK. I believe, Mr. Tinkey, that the repairman does not have to wait for the sealer before he can repair the scale. He has access to the mechanism, and does not have to drop coins in the slot to test and adjust it. I believe he can get into that machine so as to adjust and make necessary repairs with perfect freedom.

9. A ticket person weigher shall be so designed and constructed that throughout a period when the supply of tickets is exhausted, any coin which is inserted will be returned to the user through automatic delivery to a suitable receptacle on the outside of the person weigher, or the insertion of a coin in the coin slot will automatically be prevented.

Mr. FITZGERALD. Mr. Chairman, and gentlemen of the Conference, I represent the International Ticket Scale Corporation. Since specification 9 affects the company I represent, I would like to make an explanation on that point. This requires that throughout a period when the supply of tickets is exhausted, any coin which is inserted will be returned to the user through automatic delivery to a suitable receptacle on the outside of the person weigher, or the insertion of a coin in the coin slot will automatically be prevented. Now our scale, while it is susceptible to that construction, is not so constructed except in the State of Massachusetts, where you now have that regulation. The scales throughout the counties in the various States do not have that device on them. However, the danger is remote by reason of the fact that the scale has a supply of 10,000 tickets, and thus there is little chance of the scale running out of tickets.

Moreover, in all the localities the scales are under the direct supervision of employees practically all the time. Not only is there only a very small chance of the scale running out of tickets, but if by any chance this should occur the customer is in a position to get a refund, and we are always willing to make refunds.

Therefore, we respectfully ask that specification 9 be made nonretroactive, for scales out on location. When the equipment comes into the factory for reconditioning we would have that change made.

That is the only item in the code that causes us any concern. As far as the rest of it is concerned we are quite willing to follow all the requirements.

Mr. HOLBROOK. In relation to specification 9 about which Mr. Fitzgerald has just spoken, I may say that the committee did not have a request from any manufacturer to the effect that that be made nonretroactive; it has not been so recommended. However, it seems that if there are many ticket person weighers on the market or in the field at the present time, which cannot easily be modified, there may be some merit in that request. The general necessity of the specification, however, I think is undoubted. It would be unfair in general to have a machine upon the streets for the reception of a coin when

Digitized by Google

no service could be performed by the scale, as would be the case when the tickets were exhausted.

Does Mr. Fitzgerald's request impress any of you so much that you desire to make a motion that this specification be made nonretroactive? If so, it would be well to have it presented so that we can act on it.

Mr. O'KEEFE. I move that specification 9 be made nonretroactive.

Mr. LOSEY. I believe it would be very unfair to make it retroactive. These ticket weighers are in use in Baltimore, and they are pretty well taken care of.

Mr. BAUCOM. I would like to have my memory refreshed as to just how soon these recommendations go into effect after adoption by this Conference. Immediately upon adoption here, they automatically become law in my State. If you want to set a future date, we might compromise, but I want to know when it goes into effect.

Mr. HOLBROOK. So far as the National Conference is concerned, after the tentative adoption, the code is laid upon the table, usually for 1 year. Upon final adoption the code is presumed to take force and effect at once. However, as a practical matter it may be said that the date of taking effect in any State is usually the date of promulgation of the specification in that State. As you know, in general cases, the adoption of a code of specifications and tolerances here, has no legal force and effect in and of itself. It must needs be adopted in any particular jurisdiction desiring to enforce it.

Mr. O'KEEFE. It goes into effect upon the date when we notify manufacturers to comply. They are then to manufacture machines under these specifications.

The CHAIRMAN. The date of adoption is as fixed in the various jurisdictions.

Mr. A. F. BARNARD. Mr. Chairman, it seems that in a number of communities this specification will be adopted when passed by the Conference. In relation to specification 9, I presume we should first accept the specification, and then make it nonretroactive. I would amend the motion accordingly.

Mr. GRIFFITH. Mr. Chairman, it might be well to complete the reading by the secretary and then come back for action on this point.

The CHAIRMAN. I think that a good suggestion, if Mr. O'Keefe will withdraw his motion.

Mr. O'KEEFE. I will withdraw my motion.

The CHAIRMAN. No action will be taken by the Conference on this matter until we get through the specifications.[8]

Mr. HOLBROOK. In order to straighten out this question of procedure, I will try to make our usual practice plain. The method we have usually adopted was to have the specification read paragraph by paragraph, and comment invited. That is why I paused after reading each specification. Usually if this comment developed the desire of the Conference to amend, the amendment was made at once. After the reading was done the code was voted on as a whole and adopted as amended. However, as that method has not been understood, the only fair way is to complete the reading of the code.

10. A ticket person weigher shall be so designed and constructed that the printing, stamping, or transferring of the weight record on the ticket will not occur

[1] For final action of the Conference on specification 9, see p. 49.

Digitized by Google

until the weighing mechanism has had ample opportunity to come to rest, under normal person weighing conditions.

11. A ticket person weigher shall be so designed and constructed that it is susceptible of giving a clear, distinct, and definite statement or representation of weight on the weight ticket: Provided, however, That if there is an interval between zero and a definite weight value throughout which tickets are not given, then the coin shall be returned or the insertion of a coin in the coin slot shall automatically be prevented, as provided in specification 3, or the weight value shall be indicated on a dial or reading face.

This specification shall be construed to require that the specifications contained in this code and the specifications for automatic-indicating scales, relative to weight indicators, weight graduations, clear intervals between weight graduations, etc., shall apply to the representations of weight made by a ticket person weigher, when this representation is such as to make these requirements applicable. These requirements shall be broadly applied to appropriate portions of the said representations so as to require the same degree of clearness, definiteness, precision of reading, etc., in the case of both ticket and automatic-indicating person weighers.

That proviso in the first paragraph is recommended by the committee for the first time this year. The remainder of the specification is as formerly adopted.

12. When not modified by the requirements of this code the specifications given under the heading "Scales—General Specifications", "Platform Scales", and "Automatic-Indicating Scales" shall apply to person weighers insofar as they are applicable.

SENSIBILITY RECIPROCAL (SR)

The maximum SR allowable on beam person weighers shall be the value of two of the minimum graduations on the beam, at the capacity or at any lesser load: Provided, however, That the manufacturers' maximum SR or the maximum SR on all new beam person weighers shall be the value of one of the minimum graduations on the beam, at the capacity or at any lesser load.

TOLERANCES

The tolerances to be allowed in excess or deficiency on beam person weighers shall be those specified under the heading "Platform Scales." The tolerances to be allowed in excess or deficiency on automatic-indicating and ticket person weighers shall be those specified under the heading "Large-Capacity Automatic-Indicating Scales."

REGULATIONS

1. A person weigher shall be maintained in level.

2 A ticket person weigher shall be so maintained in use that all statements or representations of weight printed, stamped, or otherwise transferred on or to the weight ticket during operation shall be clear and distinct.

3. A person weigher shall be permanently and legibly marked with a statement containing the name and address of the person, firm, or corporation responsible for placing the person weigher in service, in combination with some such words as "Operated by", "Maintained by", etc.: Provided, however, That such statement shall not be required when the person weigher is in service on the premises of such person, firm, or corporation.

Mr. LEVITT. Mr. Chairman, I imagine everybody is aware that the matters in the specification have been brought out on account of certain types of manufacture. I wonder if it wouldn't clarify the entire specification to make it effective at a later date, say July 1, 1936. That would give every manufacturer sufficient time to bring his equipment up to par, and would give the States time to adopt and to put into effect these rules and regulations. No manufacturer can then say he did not have proper notice.

Mr. HOLBROOK. On July 1, 1936, then, we would have to meet the question as to which specifications shall be retroactive and which shall be nonretroactive, because on that date we are still going to

Digitized by Google

have many thousands of person weighers in use which do not comply with some of the sections of this code. Are all machines to be required to comply with all the provisions of this code as of July 1, 1936?

Mr. LEVITT. I stated the matter from a State sealer's standpoint. Of course, manufacturers putting out scales naturally would try to put out equipment that wouldn't be condemned at a later date.

Mr. GRIFFITH. Mr. Levitt may not be familiar with the fact that in 1931 this Conference adopted tentatively all these regulations and specifications with the exception of those few new items recommended by the committee at this meeting. The manufacturers of person-weigher scales have been put on notice as to the requirements for construction of their several devices. As a matter of fact, the manufacturers are now making their scales as required by these specifications. The difficulty we are confronted with, in my experience, is from the old scales which are already in use.

For your information, these requirements were adopted in 1931. They were the only guide we had in Baltimore. Immediately upon their adoption our office notified all person weigher people of record in our office that beginning in 1932 we would enforce these regulations. At the beginning of 1932 we started to enforce these regulations, not rigidly, but generally. Where scales did not conform, we endeavored to get the manufacturer, or operator, to make them conform.

During all the time that has elapsed from 1931 to 1935, those concerns have been on notice as to the requirements. If you are going to make them effective as of 1936, you are going to have the same question arise on that date as to what scales are going to be affected by the regulations, and what are not. That matter ought to be decided by this Conference. I believe the committee is warranted in making the required changes, and that they are necessary changes.

Mr. DAVIS. I want to say the commissioner of weights and measures of Vermont promulgated regulations putting those regulations which were adopted by the Conference in 1931, in force in 1933. They were made nonretroactive as to every scale that was in operation in the State before that time. Any scale that came in after that time was supposed to conform with these regulations.

Mr. RAGLAND. Mr. Chairman, I am vitally interested in this proposition, because Richmond has an ordinance which states that the code of the city of Richmond is the same as the code adopted by the National Conference on Weights and Measures. I now desire to discuss specification 2.

The CHAIRMAN. I am going to ask Mr. Holbrook to outline specification 2 again.

Mr. HOLBROOK. Specification 2 reads as follows:

2. *A person weigher shall be so designed and constructed that it has a definite and clear zero graduation and gives a definite and clear indication of its zero balance condition at all times when ready for use. In the case of an automatic-indicating or ticket person weigher the zone throughout which the zero balance condition shall be indicated shall correspond to at least 5 pounds on each side of the zero graduation.*

Mr. RAGLAND. It is foolishness to put that second section in the code. I think we ought to eliminate it.

Mr. BOWLING. Mr. Chairman, with reference to specification 2, speaking to this Conference on behalf of the operators of scales, I believe it is hard for anyone, either the public, the men in this business

Digitized by Google

service, or the Conference, to say definitely what the public desires. I have here a letter which I received today, which clearly shows the effect that section 2 has upon the earning capacity of scales, and the earning capacity naturally reflects the opinion of the public. This letter is from the general manager of the Welfare and Recreation Association, operating in the public buildings and grounds of the Federal Government, Mr. F. W. Hoover.

JUNE 4, 1935.

Mr. EDWARD E. BOWLING,
3915 Barrington Road, Baltimore, Md.:

Dear Mr. Bowling: During the month of March 1934 this association purchased a weighing machine with a free zero and placed it right alongside a machine of a similar type without the free zero, in the United States Department of Commerce Building, to determine whether there would be any preference on the part of the public between the two machines.

Since March 1, 1934, when the weigher with the free zero, which will be referred to as the new machine, was installed, the machine without the free zero has taken in in excess of 120 percent more than has the new machine.

It is believed that this test is an excellent one because the weighing machines are approximately the same size and equally attractive, and are side by side at the exit from the main dining room of the Commerce cafeteria.

Very truly yours,

(Signed) F. W. HOOVER
General Manager.

Now I ask you to become familiar with this free-zero scale before removing these other machines. Here is an example of a scale in use 13 months—people coming in daily contact with it. It is clearly demonstrated that the machine without the free zero has taken in 120 percent more than the other machine. A corresponding decrease in revenue from my machines would result in making my entire investment absolutely valueless.

Mr. LOSEY. I operate about 400 person weighers in Washington and Baltimore, and when they were modified to have free zeros, the income from them dropped off approximately 50 percent. We will lose our entire investment by having a free zero on our scales.

Mr. RAGLAND. Mr. Chairman, I move that specification 2 be stricken.

(The motion was seconded.)

Mr. GRIFFITH. It seems to me that this deserves a lot of consideration. As Mr. Bowling and Mr. Losey have said, they are interested. These gentlemen are from my city. In general, no matter what type of scale you are using, you have to know whether it is balanced at zero before you can say whether it is in proper weighing condition. There are a number of scale manufacturers here. I would like to ask them, as well as the sealers of weights and measures, if they can tell us when a scale is in proper balance if it is locked at the zero point. Certainly, unless the scale is so constructed that the beam or indicator will oscillate and come to rest at zero, you don't know whether it is in proper balance.

This section 2 requires the construction of the device to be such that you, as sealers of weights and measures, who are responsible for the accuracy of the device in use, know whether it is in correct balance. Unless you have a means of determining whether or not it is in zero balance, you cannot safely pass the scale. The facts that Mr. Bowling mentioned about the public-buildings scale indicates that there may be prejudice against a scale that oscillates. On the other

Digitized by Google

hand such a scale has a good deal of merit. How to solve that problem I do not know. I am not so much troubled with this question as I am in seeing a machine in accurate calibration throughout its capacity.

I think the specification should be maintained. Person weighers should conform to the general specifications that are applied to all legal scales.

Mr. RAGLAND. Mr. Holbrook, do our present codes require that all kinds of scales have a clear and distinct zero reading?

Mr. HOLBROOK. Yes, that is right.

Mr. RAGLAND. That is why it is my thought to eliminate this. All scales, whether person weighers or not, should have a clear zero, not a floating zero.

Mr. HOLBROOK. The person-weigher scales which you see on the street at the present time, do have, it is true, a zero indication, but in the case of the large majority of them, the zero indication means nothing. Such scales are locked at zero; they can indicate nothing else when not in use. No matter how badly the scale goes out of balance, the zero indication is always maintained.

The purpose of this paragraph is to provide that the scale shall not be locked at the zero point; it requires that the scale disclose its balance condition. The older scales cannot do this at the present time, the indicator to the contrary regardless.

Mr. RAGLAND. I have found many, many scales that were in balance, yet when I put a 50-pound weight on them, I find out there is something wrong.

Mr. Chairman, I will compromise. I amend my motion to provide that we strike out the second sentence only.

Mr. GRIFFITH. That means that we will have the oscillating free zero, and no more locked zeros; but the second sentence is explanatory of that. The part eliminated is the guide to determine the whole thing.

Mr. O'KEEFE. Mr. Chairman, we have been here since 10 o'clock this morning, and now it is 5 o'clock. After working so long on this matter, I think it would be a good thing for us all to go home and think these things over. It won't take very long in the morning to decide this matter. I move you that we adjourn.

(The motion was seconded.)

Mr. GRIFFITH. I am perfectly willing to concede to that, but I think we should give some consideration to the person-weigher men. There are 3 or 4 from Baltimore here today, and I don't know whether it is convenient for them to be here tomorrow. In deference to them, I think we ought to complete this matter today.

The CHAIRMAN. Is there any objection on the part of the person-weigher men to deferring action on this question until tomorrow morning?

Mr. BOWLING. Personally, I would like to see it cleared up tonight. Of course, I don't want to go contrary to your wishes.

The CHAIRMAN. It is moved and seconded that the Conference adjourn until tomorrow morning.

Mr. RAGLAND. I don't want the thing put off until tomorrow. I am opposed to that motion.

(The question was taken, and the motion was agreed to.)

(Thereupon, at 5:05 p. m., the Conference adjourned to meet at 10 a. m., Wednesday, June 5, 1935.)

Digitized by Google

THIRD SESSION—MORNING OF WEDNESDAY, JUNE 5, 1935

(The Conference reassembled at 10:16 a. m., at the National Bureau of Standards, Mr. John P. McBride, presiding officer, in the chair.)

ANNOUNCEMENT, AND APPOINTMENT OF SPECIAL COMMITTEE ON RESOLUTIONS

The CHAIRMAN. Gentlemen, my first duty here this morning is a very sad one. I have to report to the conference that Mr. John H. Austin, deputy State sealer of weights and measures, of Maine, met with accidental death last night. Apparently he was walking in his sleep, he fell from a window, and it is now announced that he is dead.

I am ready for any suggestions that the Conference may offer. The thought of the chair is that we might appoint a special committee on resolutions, out of regular order, to report a resolution as soon as may be.

Mr. ENGELHARD. Mr. Chairman, I move you that the chair appoint a special resolutions committee to draw appropriate resolutions regarding the death of Mr. Austin, these to be spread upon our records here, and also sent to his family and to the authorities of the jurisdiction from which he comes.

(The motion was seconded, the question was taken, and the motion was agreed to.)

The CHAIRMAN. Gentlemen, I will appoint that committee at once.

Mr. James Boyle, city sealer of weights and measures, Portland, Maine, Mr. Walter G. White, State commissioner of weights and measures, Concord, N. H., and Mr. Glenn L. Berry, county superintendent of weights and measures, Asbury Park, N. J.

FEDERAL SPECIFICATION AAA-S-121 FOR WEIGHING SCALES

By RALPH W. SMITH, *National Bureau of Standards*

Federal specification AAA–S–121 for weighing scales is one of a large number of Federal specifications developed and promulgated primarily for use in connection with Federal procurement projects. These Federal specifications cover a very wide field. They range all the way from acetone to zinc oxide, from adzes to wrenches, from artillery to wheel barrows, from asparagus to yeast.

These specifications are purchase requirements and embody technical specifications for the subject material, methods of inspection and test, and packaging, packing, and marking requirements. Their preparation rests with a group of technical committees, each committee dealing with a closely related group of specifications. The work of the committees is directed and coordinated by a single body which, until early in 1935, has been the Federal Specifications Board.

The Federal Specifications Board was organized under the authority of Circular 42, of the Bureau of the Budget, dated October 10, 1921. The duty of this Board was "to compile and adopt standard

Digitized by Google

specifications for materials and service, and to bring specifications into harmony with the best commercial practices wherever conditions permit." It was ordered that the Director of the National Bureau of Standards should be ex-officio chairman of the Board, and the Board was to function under the general direction of the Chief Coordinator for General Supply, an officer of the Bureau of the Budget. The circular further stated that "the specifications that are prepared, adopted by the Board, and approved by the Director of the National Bureau of Standards shall, as far as applicable, be binding upon and govern all departments, bureaus, agencies, and offices of the Government."

By the terms of Executive Order 6166 of the President of the United States, dated June 10, 1933, there was created a Procurement Division in the United States Treasury Department, headed by a Director of Procurement. This order stated that "in respect of any kind of procurement, warehousing, or distribution for any agency", the Procurement Division might undertake the performance of such procurement, warehousing, or distribution, or might entrust such performance to other agencies. Under an order of the Secretary of the Treasury approved by the President of the United States on October 9, 1933, the functions of the Federal Specifications Board were transferred to the Procurement Division; the Board continued, however, to function as a distinct body, much as before, the regulations prescribing that "under the direction of the Director of Procurement, the Federal Specifications Board will prepare purchase specifications for supplies used by the several executive departments, with due regard to available commercial types, grades, and sizes." However, these regulations introduced one important modification of procedure, this being a liberalization of the former rule that Federal specifications were binding in the case of all Federal purchases. The new regulation reads as follows:

> If any Executive Department finds that for administrative reasons a Federal specification cannot be used to meet its particular or essential needs, it is authorized to use its own purchase specification, but such specification shall include all applicable provisions of the Federal specification, and in those cases where the purchase exceeds $1,000 a report shall be made to the Procurement Division, Branch of Supplies, showing the necessity for deviation from the Federal specification.

On January 24, 1935, the Federal Specifications Board was abolished; this was accomplished by an order of the National Emergency Council, a group headed by the President of the United States. The business of the Board could not immediately be concluded, however, and it was not until May 7 that the final meeting was held and the Federal Specifications Board actually disbanded. The best information available at the present time is that the work formerly done by the Federal Specifications Board will be continued by a Federal Specification Section of the Procurement Division, under the direct charge of an officer to be known as the Technical Assistant to the Assistant Director of Procurement. In lieu of the members constituting the old Federal Specifications Board, there are now being appointed technical liaison representatives, from each executive department and independent establishment of the Government. It is anticipated that the technical committees will continue to function as in the past and that the specifications promulgated will continue to be known as Federal specifications.

Digitized by Google

Concluding this brief outline of the history of the Federal Specifications Board, I may say that later on the program of this Conference, a number of general aspects of Federal specifications, with particular reference to the consumer, will be discussed by Dr. A. S. McAllister.

The technical committee responsible for the development of Federal specification AAA–S–121 is the Committee on Commercial Weighing and Measuring Devices, of which Mr. F. S. Ho brook is the chairman, and your speaker the secretary. The first meeting of this committee was held on December 1, 1924. Meetings of the committee have been held at irregular intervals since that time as various matters came before it for consideration. Federal specifications have been developed by this committee on four items: Railway track scales, liquid-measuring devices, stop watches, and a general specification for scales, the latter being now designated specification AAA–S–121. Work is almost completed on a specification for prescription scales and weights. The specification for railway track scales includes as its technical requirements the provisions of Bureau of Standards Circular C83, the well-known "Specifications for the Manufacture and Installation of Railroad Track Scales." The Federal specification on liquid-measuring devices closely follows, in its technical requirements, the code of specifications and tolerances for liquid-measuring devices of the National Conference on Weights and Measures. There was no existing specification on stop watches, and the Federal specification for this item naturally consists of new material.

The general specification for scales as originally developed embraced only very general requirements, closely following the general specifications for scales of the National Conference on Weights and Measures. This specification was first known as master specification 473. With the development of the Federal Standard Stock Catalog, Federal specifications were classified and indexed, and the general specification for scales was then identified as AAA–S–121.

Several years ago the committee was requested to include in its general specification for scales, requirements relative to automatic-indicating scales. The work of revision was undertaken and as this work progressed it was decided to amplify the scope of the specification to make it a more or less complete purchase specification for all ordinary types of weighing scales purchased by the Federal Government. The work of revision was completed late in 1934 and the specification recommended to the Federal Specifications Board for promulgation. It is expected that copies of the printed specification will very shortly be available from the United States Government Printing Office.

This specification does not cover prescription scales, cream-test scales, and railway track scales. This specification differs from the specifications of the National Conference in form and, to a considerable extent, in text. At the beginning of the specification is a section containing some 18 definitions; this arrangement makes it unnecessary to introduce definitions into the body of a paragraph setting forth technical requirements. The definitions are followed by a section of "general requirements", in which are grouped those paragraphs which are applicable to weighing scales in general. The section of "detail requirements" is next in order, and this is subdivided into requirements for beam scales, requirements for automatic-indicating scales,

Digitized by Google

requirements for weights, and performance requirements including tolerances and maximum allowable SR values. Four additional sections complete the specification, the first on "method of inspection and test", the second on "packaging, packing, and marking", the third listing "requirements applicable to individual departments", and the fourth comprising "notes."

As compared with the National Conference codes, the text of specification AAA–S–121 has often been condensed, and all tolerance tables are condensed; being a purchase specification the tolerances and SR values given are, of course, those for new equipment. While the majority of the technical requirements are those of the Conference specifications, some have been chosen from specifications of the American Railway Engineering Association, and some represent new material developed by the committee; credit is given in the specification to the National Conference as the source of much of the technical matter of the specification. The specification has been criticized for the alleged inadequacy of its engineering requirements, as compared, for example, to the specification of the AREA for motor-truck scales. It is believed, however, that specification AAA–S–121 will serve its particular purpose very well.

The National Bureau of Standards makes available to the Committee on Commercial Weighing and Measuring Devices, information in its files and, when necessary, conducts studies for the information of the committee, just as is done in the case of the Committee on Specifications and Tolerances of this Conference. Many of you will recall investigations formerly made by the Bureau and reported to the Conference, on fabric-measuring devices, liquid-measuring devices, grease-measuring devices, and taximeters.

Another such study was recently made, the results being utilized by both of the committees I have mentioned. This investigation was undertaken in connection with a question which first arose in relation to the requirements of the Federal specification and the National Conference codes for certain minimum clear intervals between graduations indicating weight or money values. In its final phases this study involved some novel features which it is thought will be interesting to you.

Specifically the issue revolved about the requirement for a clear interval of 0.02 inch between value graduations on a computing-scale chart. This requirement has been in effect for many years in the Conference specifications, and its provisions had been universally applied to the actual clear interval between graduations on the chart itself. The thought was recently advanced by a manufacturer of computing scales that this requirement applied equally to a chart viewed without the aid of any magnifying element and to one necessarily viewed through a lens which magnified the image. It was urged that if what was seen by the unaided eye was satisfactory, a corresponding image seen through a lens should also be satisfactory.

This seemed to be a logical contention. As a matter of fact, I am informed that the Committee on Specifications and Tolerances of the National Conference gave attention to magnifying devices at the time the original specifications were adopted. However, at that time—20 years or more ago—the magnifiers in use were somewhat crude affairs; they often distorted the graduations, and thus it seemed that they were not very helpful and that it was not advisable to allow more

Digitized by Google

closely spaced graduations when these magnifiers were employed. The situation has now greatly altered, and the magnifiers in general use are superior to those formerly employed. Consequently, it seemed that the matter should be reviewed.

Assuming that a suitable change were to be made in the specification to recognize the principle mentioned above, the question arose as to a method which might be used to determine in a given instance that the magnified image of a chart having graduations less than 0.02 inch apart did, in fact, correspond to an unmagnified image of a chart having graduations 0.02 inch or more apart. The difficulty was that a magnified image is somewhere in space and cannot be directly measured.

Beginning with the actual clear interval on the chart itself, which can be directly measured, it might seem reasonable to suppose that the linear magnification of a given lens system could be determined, and that, by finding the product of the actual clear interval and this multiplying power of the lens, we would directly arrive at the desired value representing the apparent clear interval when viewed through the lens.

This would, in fact, be the case if the magnified image of the chart were at the same distance from the observer's eye as is the chart itself. Actually, however, a lens of the type used on computing scales not only produces a magnified image of the chart but also displaces this image backward from the observer's eye. In consequence, a portion of the effectiveness of the magnification is lost because the magnified image is viewed from a greater distance than is the chart without a lens in place. Both of these effects of the lens—that is, the magnification and the displacement of the image—are taken into account if we employ angular magnification rather than linear magnification.

In other words, the apparent size of an object is dependent upon its distance from the observer's eye. The greater the distance from the object to the eye, the smaller is the angle subtended at the eye by the object, and the smaller is the apparent size of the object [demonstrates on blackboard]. Linear magnification is calculated from the focal length of the lens and the distance between object and lens; angular magnification, in addition, gives weight to the factor of the distance between the image and the eye of the observer. It follows, therefore, that, in considering the magnification of a lens in our scale problem, it was angular rather than linear magnification which we were required to deal with. That, in turn, necessitated, before angular magnification could be calculated, the adoption of some value as the distance of the eye of the observer from the lens, and some assumption as to the position of the observer's eye when the lens was not in place. We adopted 12 inches for the distance in question, and it was assumed that the observer's eye would remain in the same position whether or not a lens were used.

The theoretical value derived as outlined above was checked by direct measurements of the subtended angles of a given chart interval with and without a lens in place. The measurements were made by means of a theodolite mounted with its trunnions in the position assumed to be occupied by the observer's eye. The results of this straightforward method of determining angular magnification agreed very well with the theoretical value.

Digitized by Google

A further check was attempted by photographic methods, because it was felt that if there could be procured physical embodiments of what appears to the eye when observing magnified and unmagnified charts, some aspects of the problem would be simplified, for in this event these could be directly compared and measured. Accordingly a camera was prepared with the ordinary camera lens replaced by a "pinhole"; such a camera gives universal focus effects, and, when the bellows extension is kept constant, may, for comparisons of large dimensions, be assumed to represent the conditions of natural vision. Photographs of the magnified image made with the pinhole of the camera 12 inches from the scale lens, and of the unmagnified image made with positions of camera and scale unchanged were compared, measurements being made on the glass negatives and angular magnification under the stated conditions being computed therefrom. The result was in good agreement with the results obtained by the two other methods.

Having reached this point, it seemed that the investigation was satisfactorily concluded, three methods productive of mutually concordant results having been demonstrated. Very shortly, however, the interested manufacturer represented to us that the basis of all of our computations, theodolite measurements, and photographs was not in conformance with the conditions which would prevail in the commercial use of the scale, in that it had been assumed that the position of the observer with respect to the chart of the scale would remain unchanged whether or not a lens were interposed between the chart and the observer's eye. It was the manufacturer's contention that when an observer viewed the chart through a lens he would be closer to the scale than he would be with no lens present, and that his approach to the scale would equal the distance by which the magnified image was displaced backward from the chart—in this instance, some 2¾ inches.

While the Bureau did not question that the manufacturer was sincere in his belief, it doubted very much that his belief would be realized. Since there were no experimental data available, however, it was a case of "one man's guess being as good as another's." Moreover, you will readily see that the question was fundamental to our problem, since the nearer the observer approached the chart the larger would be the image on his retina; in other words, his approach would, in effect, be equivalent to enlarging the distance between the graduations or to employing a stronger lens. Therefore it was apparent that experimental data on the point should be secured, and accordingly our investigation was resumed for the purpose of learning by experimental methods just what would take place under the conditions involved. In planning this study the aim was to eliminate, insofar as practicable, all variables except the presence or absence of the lens. This is how we went about it.

We decided to make this study as practical as possible, recording by means of large numbers of photographs the actual positions of a representative group of at least 100 observers.

We secured from the manufacturer a special chart with two series of graduations, the widths of the lines and clear spaces being such that the appearance of the more widely spaced series when viewed with the unaided eye was substantially the same as the appearance of the more closely spaced series when viewed through the lens being stud-

Digitized by Google

ied. This chart was mounted in a regular scale, with a lens before the closely spaced graduations only, and the scale was mounted in a fixed position at a height approximating a commercial installation.

A combination of apparatus was then assembled to permit of the photographic recording of the positions of the group of observers reading the indications of the two series of graduations. The set-up is indicated diagrammatically in figure 1. As close as practicable to one side of the scale a ground-glass screen, 20 inches square, was clamped in position; this screen was ruled into 1-inch squares by means of steel wires attached to the frame. The center horizontal wire was at the same height as the indicator of the scale. The vertical wires were numbered to indicate their perpendicular distance from the front surface of the scale lens, the central vertical wire being 12 inches from the lens. There was provided a means for indicating in one

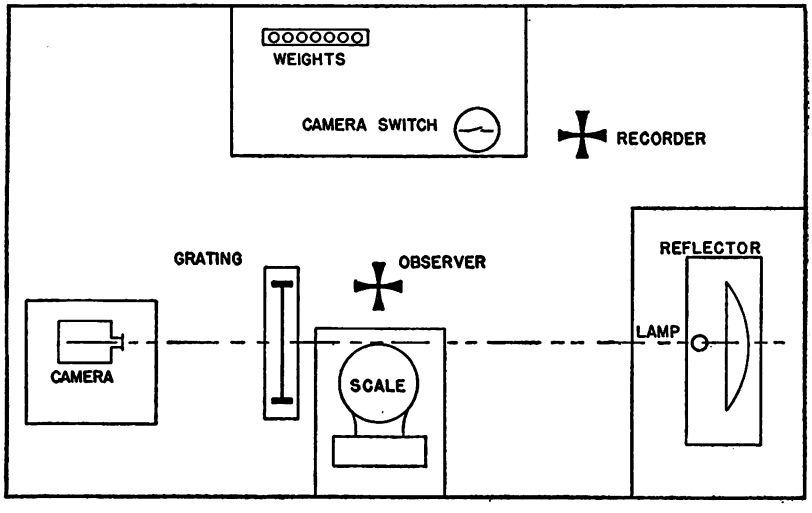


FIGURE 1.—*Arrangement of apparatus for investigation of position of observer with respect to scale.*

corner of the screen the designating number of each observer and the letter "L" or "R" to show which series of graduations was being read.

Close to the other side of the scale was mounted a 24-inch reflector in combination with a concentrated-filament lamp, and adjustment was made to produce a beam of parallel light directed against the screen. The central axis of the beam passed through the center of the screen at 90°.

On the opposite side of the screen was mounted a camera of special design, electrically operated, adapted to utilize standard motion-picture film and to make individual exposures.

A group of small weights of uniform value was provided for the use of the observers. The recorder was so positioned that he had an unobstructed view of the observer at all times, and the switch for controlling the camera was conveniently at hand.

Disregarding the preliminary work, during which many observations were made, final results were secured from 104 observers. As

Digitized by Google

to the characteristics of this group, I may say that 76 percent were men, 24 percent were untrained observers, 36 percent wore glasses, the average age was 37 years, and the age range was 19 to 66 years. All instructions to observers were in writing, to place each observer on the same basis as all others. Each observer was given full instructions for reading the scale indications and full opportunity to familiarize himself or herself with the scale. Instructions for the "record" observations stressed the accuracy of the reading but, of course, made absolutely no reference to the distance of the observer from the scale; further to focus the attention of the observer on the idea of accurate reading, all values announced by the observer were carefully recorded by the recorder, although the only purpose of this was the psychological effect.

The method of operation was for each observer to make 12 consecutive readings from one series of graduations, weights being applied by him to the scale platter one at a time. A similar series of observations was then made from the other series of graduations. The first two observations of each series were not officially recorded. For each of the others, the recorder closed the camera switch as nearly as possible at the exact instant when the observer was actually making his reading, photographing the shadow of the observer's profile on the ground glass screen and thus definitely recording the observer's distance from the scale lens. [See fig. 2.] The real purpose of the observations was not revealed to the observers, and none of them knew that we were interested in their position with respect to the scale; in fact, the majority of them were ignorant of the fact that any photographs were being made.

When all of the negatives were secured, the photographic results were reduced to numerical data by projecting each negative on a screen, the positions of the various observers being then read and checked by two persons. The distance of the observer from the scale was read to the notch in the silhouette nearest to the observer's eye. [See figs. 3, 4, and 5.] Results were then averaged for each group for each observer, the difference was determined between the mean values for the two series for each observer, and the resulting data were analyzed. In all computations of "differences" the position of the observer when viewing the unmagnified chart was considered the standard, and the position when viewing the magnified chart was compared with this. Thus if the observer was closer to the scale when viewing the magnified chart than he was when viewing the unmagnified chart, his difference was considered to have a minus sign; when conditions were reversed, the difference was called plus.

In figure 6 is shown a distribution chart of the "differences" for the 104 observers. For all observers the mean difference was -0.7 inch, which is to say that the average observer of our representative group approached the scale 0.7 inch when viewing the magnified image as compared with his position when viewing the unmagnified image. Differences for individual observers ranged from -3.4 to $+3.1$ inches. Seventy-five percent of the observers had minus differences; 21 percent had plus differences; 4 percent had zero differences—that is, their mean positions for the two series of observations were the same. It is interesting to note that the mean difference for observers wearing glasses was approximately twice that for ob-

Digitized by Google

Digitized by Google

Digitized by Google

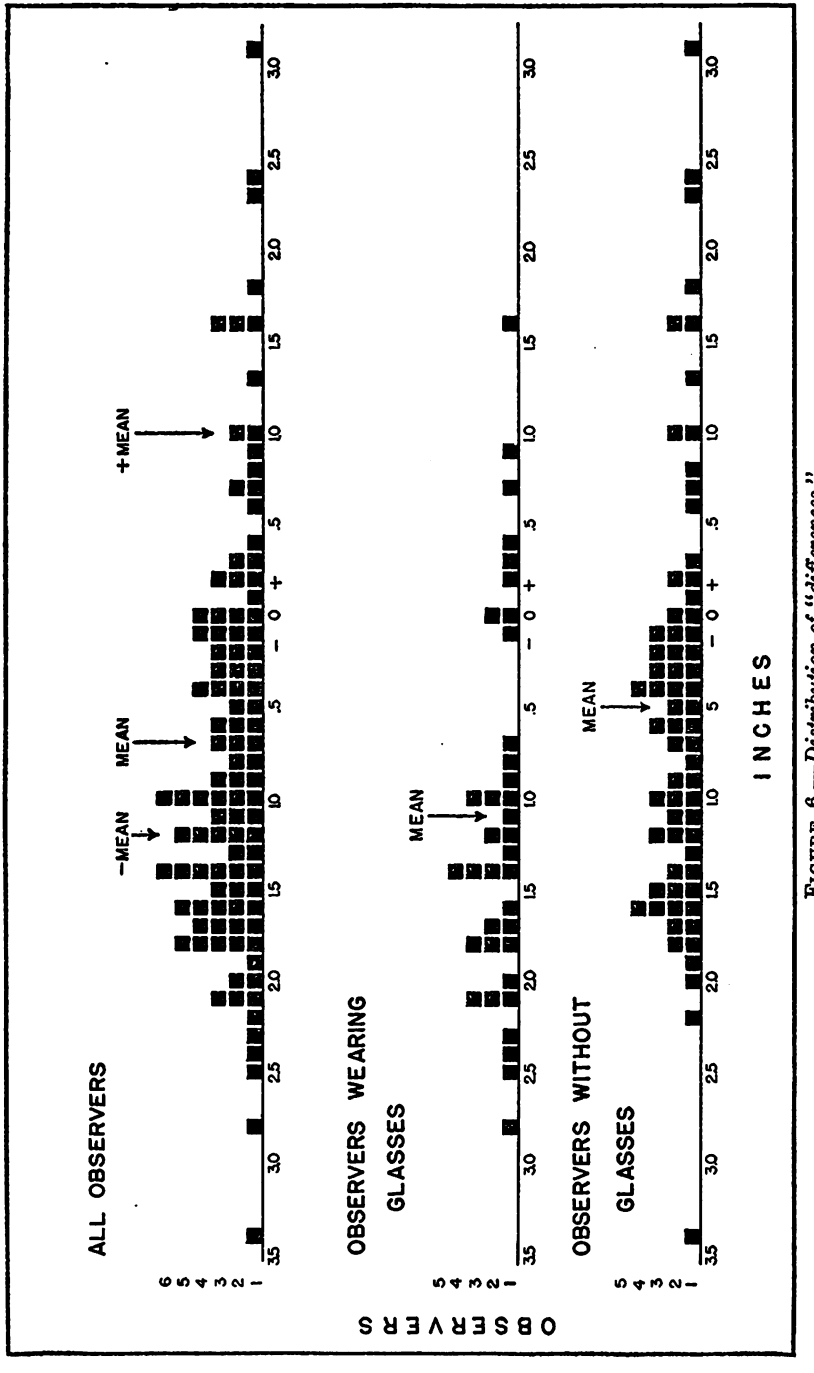


FIGURE 6.—*Distribution of "differences."*
[Chart showing results of observer-position investigation]

Digitized by Google

servers without glasses (−1.1 and −0.5 inches). Mean differences were the same for trained and untrained observers, and for men and women. When the differences were plotted according to the ages of the observers, there was indicated a trend toward increased minus differences with increasing age. When the results were distributed on the basis of the nearsightedness or farsightedness of the observers, no significant information was disclosed.

Another interesting fact developed was that for readings of the magnified chart the average position of the observer's eyes was 9.05 inches from the outer surface of the lens; this was increased to 9.75 inches for readings of the unmagnified chart. For all observers these positions ranged from 2.8 to 15.9 inches for the magnified chart and from 4.3 to 16.9 inches for the unmagnified chart.

From all of these results it appeared that there was something in the contention that the average observer would position his eye somewhat nearer to the chart when a magnifier was employed than he would when no lens was in place, and would thus, in effect, slightly enlarge the magnified image. The results indicated that the estimate that the observer would position his eye 2¾ inches closer to the chart when utilizing the lens, was not borne out in practice, the actual advance being only about one-fourth of this figure. The experimental result enabled the Bureau to decide what magnification was necessary to produce an image equivalent to the image of an unmagnified chart. The work was undoubtedly worthwhile, because it not only solved the case at hand but gave us a better insight into the fundamental requirements and laid the groundwork for the formulation of a general specification on the subject of magnifiers. The committee decided to recognize the principle that if a certain combination of graduation lines, clear interval between graduation lines, and indicator is to be permitted on an unmagnified system, there should likewise be permitted any combination which, when necessarily viewed through a magnifying system, presents to the eye of the observer an apparent combination not less readily readable than the unmagnified combination. This is expressed in specification AAA–S–121 in the following language:

Magnified Indicating Elements.—When in normal usage any indicating elements are necessarily viewed as magnified by means of a lens system, the requirements of paragraph D–7a as to minimum width of graduation and of paragraph D–7b [relative to the clear interval between graduations] shall be that the apparent size of the magnified image of such elements as seen by an observer occupying a normal average position with respect to the scale shall be equivalent to the apparent size of elements complying with the stated requirements and viewed by the unaided eye from a normal distance.

It is my understanding that a similar paragraph is to be presented somewhat later for your consideration by your committee on specifications and tolerances.

It seems to me to be an excellent plan to make such investigations as the one I have outlined, for the purpose of the development of proper general specifications. When these requirements are founded on demonstrated facts, they are less open to legitimate objection and they should inspire a feeling of confidence on the part of all concerned—the manufacturer who produces in accordance with them, the official who enforces them, and the consumer who buys over apparatus regulated by them.

Digitized by Google

I think it probable that we shall hear much concerning magnification in the near future, and so it is well to have outlined the basis underlying the use of magnifiers. A guide to manufacturers planning new designs will certainly facilitate the development work necessary, and will do much to forestall expensive failure.

In conclusion I wish to say that the National Bureau of Standards does not have available for distribution copies of Federal Specification AAA–S–121. The regulations governing the distribution of Federal specifications provide that those desiring copies must secure them through purchase from the Superintendent of Documents, United States Government Printing Office, Washington, D. C. We understand that the price of this specification will be 5 cents per copy.

The CHAIRMAN. Thank you, Mr. Smith. I am sure that the delegates appreciate the time and effort that you have spent in the preparation of your paper, and it demonstrates clearly the distinct contributions that the Bureau offers to the States and to the manufacturers on questions of this nature.

DISCUSSION OF REPORT ON SPECIFICATIONS, TOLERANCES, AND REGULATIONS FOR PERSON WEIGHERS—Continued

The CHAIRMAN. Now, gentlemen, we will resume our program where we suspended yesterday. We were discussing the committee report on the person-weigher code, paragraph 2.

Mr. O'KEEFE. Mr. Chairman, Mr. Holbrook and his committee have given these items a great deal of thought, and I think that their considerations have been not for some local community, but for the United States at large. I think their conclusions in the matter should be adopted by this Conference. So, I move you, Mr. Chairman, that the recommendation as submitted by this committee be adopted as a whole.

(The motion was seconded.)

Mr. HOLBROOK. In order that the Conference may not take action without all facts in mind, I may say there was a proposal made and debated yesterday that specification 9 be made nonretroactive. Your committee took no stand on that. Except to call it to your attention, I have nothing to add to what I said yesterday, in that relation.

Mr. BAUCOM. Mr. Chairman, I feel that some of these men probably have not a clear-cut conception in their mind as to the difference between the specifications and the regulations. As I understand it, a specification is just a guide to the manufacturer in the construction of his scale. A regulation, as I conceive it, is what we have to enforce to make sure that apparatus in use complies with the specifications.

Now if we make this specification 9 retroactive, scales already made, and in use, will have to be rebuilt. I think a regulation can be drawn in any section to cover this. But if you draw a specification and make it mandatory on scales in use, you will find that these scales do not comply. I do not feel that this should be retroactive.

There is one other point I would like to bring to your attention. That is the requirement that the maximum allowable sensibility reciprocal shall be the value of two of the minimum graduations on the beam for scales in use. I don't think there is a scale manufacturer here who would admit he could not comply with a sensibility recipro-

Digitized by Google

cal of one of the minimum graduations on the beam; that is, 1 pound. I would like to make an amendment to require that the maximum allowable sensibility reciprocal on scales in use be the value of one of the minimum graduations on the beam.

Mr. HOLBROOK. Mr. Baucom, the sensibility reciprocal requirement in this specification is identical with the requirement embodied in the code for commercial platform scales. If the values were to be cut to the value of one of the minimum graduations and one-half of one of the minimum graduations, for scales in use and for new scales, respectively, we would be in a position of demanding that person weighers be twice as sensitive as commercial scales in use in the country at the present time. Moreover, this would be a particularly difficult thing to enforce, because, whereas in the case of the commercial scale the manufacturer may select his own minimum graduation, in the case of person weighers the value of the minimum graduation is rigidly specified, 1 pound. I hardly think that the Conference would want to take the attitude that a person weigher should be subject to more stringent regulations than commercial scales.

Mr. WALDMAN. Will Mr. O'Keefe agree to an amendment that specification 9 be nonretroactive? I think that is of value and I make that amendment.

Mr. O'KEEFE. I will accept the amendment so far as I am concerned. However, I would like to hear an expression from the committee. They have given this a lot of thought and I think they ought to be heard.

Mr. HOLBROOK. The committee has not taken any action since the proposal was made that specification 9 be nonretroactive. The committee was not requested to consider the advisability of making this specification retroactive. I think in this particular instance we would have to poll the committee individually. Personally I would have no objection to seeing the specification made nonretroactive. The other members might express their own thoughts on the matter.

Mr. SCHIEMER. Mr. Chairman, if this code is passed by the Conference today, is my understanding correct that it would be up to the various States to set some date after which it is to be effective? Is it intended that it date back 3 or 4 years? What would the recommendation of the Conference be?

Mr. HOLBROOK. This specification upon adoption by this Conference is automatically recommended to the States for adoption. Each State which adopts the code will presumably set a date at which it is to take effect.

Mr. SCHIEMER. Would that be some date prior to this time, or some date hereafter?

Mr. HOLBROOK. At some time in the future. The retroactive specifications of the code would take full effect at that time. The nonretroactive specifications would take effect only on new apparatus being brought into a jurisdiction, or sold in a jurisdiction after the date of promulgation in the jurisdiction. The apparatus in use at the time of the promulgation would not be liable to be condemned on account of failure to comply with specifications which are nonretroactive in their terms.

Digitized by Google

Mr. GRIFFITH. Unless the jurisdiction has already adopted and promulgated them.

Mr. HOLBROOK. As I said, that depends upon the jurisdiction adopting it.

Mr. GRIFFITH. Mr. Chairman, what Mr. Schiemer is trying to bring out is the fact that in Baltimore we adopted these specifications in 1932. Certainly after that date the manufacturers were put on warning that the specification would be enforced. Mr. Schiemer wants to know whether the passage of paragraph 2 of this code, which is now being made nonretroactive, affects the former adoption of the code in jurisdictions such as Massachusetts, Ohio, and Baltimore, which already have put this paragraph into effect.

Mr. SCHIEMER. I just wanted to get the opinion of the Conference itself. Mr. Holbrook, in view of the fact that some changes are being made in the tentative code adopted by the Conference, I wonder if the Conference would consent to let it lie on the table for a year—until the next Conference. We could then have a final hearing before it is effective in any jurisdiction where it has worked a hardship on some of us.

Mr. HOLBROOK. So far as the National Conference on Weights and Measures is concerned, this code is tentative until finally adopted. We have been over the ground very thoroughly in this Conference. It must be granted without question that any jurisdiction, which has power to make rules and regulations on apparatus, may make rules and regulations without reference to any action of this Conference. Such a jurisdiction may take the code as proposed by this Conference, or it may write an entirely independent code without reference to this Conference, or it may amend the Conference code as it sees fit to do so. Neither the Conference nor the National Bureau of Standards will attempt to interfere with any such action, nor will these organizations attempt to take any action whatever in cases where a code has already been adopted.

The CHAIRMAN. Gentlemen, are you ready for action on the question? The question is on Mr. O'Keefe's motion that the code of specifications, tolerances, and regulations for person weighers be adopted as recommended by the committee on specifications and tolerances.

(The question was taken, and the motion was agreed to.)

Mr. HOLBROOK. For the sake of the record, may I ask whether Mr. O'Keefe accepted the amendment to make specification 9 nonretroactive?

Mr. O'KEEFE. Mr. Chairman, I said I would accept that amendment, but I asked for the opinion of the committee. The committee was not polled about the requested amendment; however, it was all right with me.

The CHAIRMAN. The motion to amend was not seconded; therefore, the amendment was not properly up for consideration.

Mr. ROGERS. Mr. Chairman, so far as the committee is concerned, the suggestion made here was never heard before the committee. I think either decision would be satisfactory to the committee.

Digitized by Google

SUPERVISION OVER THE BUYING OF OLD GOLD

By ELLIOTT B. HOLTON, *Assistant Superintendent of Weights and Measures, State of New Jersey*

Late in 1933 the price of gold began to climb as the Federal Government entered the market to buy up the precious yellow metal. Daily the price per troy ounce rose, until the value was fixed at $35 an ounce through the action of the President, who revalued the United States gold dollar by proclamation of January 31, 1934, under the act of May 12, 1933, as amended by the Gold Reserve Act of January 20, 1934. This was an increase of about 69 percent over the rate that had prevailed for years.

During this period of skyrocketing prices, gold was brought to the attention of the great American public. It was made gold-conscious by advertisement, by newspaper comment, by radio, and by personal door-to-door canvassing. Citizens were made aware of the fact that there was ready money waiting for the accumulations of worn-out, broken, and discarded jewelry lying about the houses of the Nation. And with this first wave of excitement that swept the country came a horde of nimble-witted gentlemen who were eager to aid the householder to convert his old gold into cash, with, of course, mental reservations as to the amount of profit these same clever men could make for themselves.

Many of the pioneer gold buyers knew no more than that gold was a yellow metal and that it was valuable, but at that they were two steps ahead of the average citizen.

So long as gold buying had been confined to trading with legitimate dealers, in long-established stores and factories, there was small cause for doubt as to the honesty and integrity of those engaged in this business. With the advent of the house-to-house canvasser, it was vastly different. These itinerants were "birds of passage", who had no fixed location and who roamed the earth like a band of gypsies. As theirs was a "hit-and-run" trade, they never tarried long in a neighborhood. It became a merry old game of hide and seek to track down these wandering merchants and check on their methods of doing business.

Not long after the "fly-by-night" type of gold buyer made his appearance on the scene, stories came to the ears of weights and measures men that scales were false; that weights were as bad; and that all of the time tested and proved knavery and crooked weighing were in use. Some of these tales turned out to be wild rumors; others were true in all the sordid details.

The local departments of the State of New Jersey scouted around in cars attempting to catch up with the clever boys who were making a racket of gold buying. The State department prepared articles warning the public to beware of the men who came to the house to buy gold and suggested that it would be better to deal with established firms. These articles appeared in the leading daily newspapers of the State, which were willing and powerful allies in the educational campaign.

At the January 1934 midwinter conference of the weights and measures association, superintendents, who had felt the first effects of the gold buyer and his shady dealings with the public, acquainted the members present with the sharp practices that had come to light in their territory.

Digitized by Google

One of the first clever dodges that was run to earth and broken up was that of using scales that were held in the hand of the gold buyers. Adept handlers of this type of scale could throw the balance by a muscular twist and always in their own favor. A ruling promulgated by the State department made the use of this scale illegal. Only scales that were mounted on a rod or stand and were beyond the reach of clever hands to deflect pans were permitted. All others were to be confiscated and the owners prosecuted.

Another deceitful buyer used a 1-cent coin as a pennyweight unit, thereby gaining double value on his purchases of old gold. Too numerous for repetition are the tales of would-be sellers who refused the first appraisal of their goods, then went to a reliable dealer who gave them 4 and 5 times as much as the first offer.

The men in the field and the Trenton office kept a vigilant eye on gold buyers. The monthly bulletins of May and August 1934 both called attention to the fact that gold buyers were still abroad in the State. From May 5 to June 30, 1934, an intensive drive was made. One of the State assistants accompanied the local city and county men to all persons and firms dealing in gold. He reported as follows:

Test of—	Correct	Adjusted	Condemned	Total
Equal-arm balances	125	4	7	136
Troy weights	1,079	376	133	1,588
Karat weights	758	25	37	820

In Jersey City, second largest city in the State, no person, firm, or corporation may engage in the business of buying old gold without having first obtained a permit from the chief of police. Since the police and the weights and measures departments are in close harmony no gold buyer starts without having a permit or a test of his scales and weights.

A total of 74 permits were issued in Jersey City and during April the local tests were as follows:

Test of—	Correct	Adjusted	Condemned	Total
Scales	44	2	33	77
Troy weights	849	156	272	1,142

Probably the worst set of equipment was picked up in Jersey City. This consisted of four irregular lumps of a metal, presumably lead, and a bronze souvenir medal. Without rhyme or reason the lightest weighed 5 pennyweights, 22 1/20 grains, and the heaviest 1 ounce, 5 pennyweights, 10 3/4 grains.

Much has been inferred as to the dishonesty of the gold buyer in the first part of this paper, but it must be stated here and now, that not all the men who engaged in this work tried to make a racket of it. There are many phases of gold buying that may confuse the layman and that tend to put the dealer in a far more unfavorable light than that in which he should be placed. For instance, while the Government rate is $35 an ounce, few pieces of 24K gold are to be found. Since alloy is worthless, a quantity of 14K gold is valued

Digitized by Google

only at 1¼ of $35, or $20.41. Gold of lesser karat weight is worth proportionately less by the gross ounce.

Most important to bear in mind is that while the Government pays $35 an ounce, the gold buyer is not in business for his health nor is he working for the convenience of householders who deal with him. The gold buyer is entitled to a profit for his time and work, but it should be a fair profit and not an illegitimate one.

If time will permit, it might be well to acquaint you all with the far from easy matter of selling gold direct to the Government. Two assay offices are located in downtown New York and they are open from 10 a. m. to 2 p. m. A locked gate confronts the citizen as he approaches, which is opened by a guard and closed behind him. There are two windows at which gold is tested and weighed and a citizen must have an affidavit with him that he acquired and transported the gold legally. All gold-filled articles of less than 200 in 1,000 parts are promptly turned back by the clerks. Tests by file and acid come next, after which the heap is weighed and a receipt given the depositor, while a duplicate accompanies the gold through the assay office.

Each lot of gold is melted down separately and is poured in a rough ingot ½ inch thick by 3 by 6 inches. The after and before melting weights must agree. Two samples are nipped from the cold bar and these are the size of a .45-caliber bullet. Three skilled assayers run the tests, and when the gold content has been determined the depositor is notified to come for his check. A deduction is made for the handling charge. Possibly a week may elapse before the citizen who brought the old gold to the assay office receives his money for it.

After you have heard this tale of red tape and waiting you may understand why a citizen with an ounce or fraction of an ounce of old gold is willing to turn to the gold buyer to take on this trouble.

Gold buying was one of those sudden emergencies that so often confront weights and measures departments throughout the nation. The usual vigilance of an alert corps of men reduces the period during which the uncontrolled and fraudulent practices may rage and the matter is soon well in hand and regulated for the protection of the general public and the honest merchant.

The CHAIRMAN. Thank you, Mr. Holton.

A STUDY OF THE PROMULGATION OF RULES AND REGULATIONS AS APPLIED TO THE VARIOUS STATES OF THE UNION

By C. D. BAUCOM, *Superintendent of Weights and Measures, State of North Carolina*

Mr. President, members, and guests: When Mr. Holbrook requested that I prepare a paper on weights and measures regulations, exclusive of specifications and tolerances, as promulgated by the various States of the Union, I hesitated, and it was with reluctance that I accepted, knowing that to do the subject justice, research work would require more time than intervened from then until convening of the Conference. However, I immediately sent out questionnaires to all of the States and the District of Columbia asking that copies of laws, rules, or regulations under which they operated, and any comments they might have as to contemplated regulations, be sent as promptly as possible together with return of questionnaire. Of these 49 questionnaires sent out, 35 were returned and right here I wish to

Digitized by Google

express my appreciation of the cooperation and comments, in compliance with my request.

The rules and regulations promulgated by the various States are, in general, synonymous with those adopted by this National Conference and recommended by the National Bureau of Standards. I notice that some States have adopted such rules and regulations by act of legislation. Out of the 35 States reporting, 22 of them have adopted Handbook M85 as a general guide in carrying out the mandates of the law. Two or more States make rules and regulations acts of legislature. Fourteen States place in the enforcing office the power to make rules and regulations. The regulations in 11 States are promulgated and/or approved by a board of authority. Eight States reporting have no State enforcing agency at all. However, as a carry-over of old laws, these States give power to county, municipal, or local authorities to appoint local officers for enforcing weights and measures. Thus you will see from the foregoing that to give a résumé of the rules and regulations promulgated under the various set-ups and conditions would extend far beyond the time allowed for this subject and intrude upon your patience as well.

In studying this subject as carefully as time would permit and by a process of separation, analyzation, and coördination, deductions reveal that rules and regulations promulgated by the various weights and measures set-ups fall into five classes or systems as follows: First, by act of legislature; second, by commissioners, superintendents, or enforcing officers; third, by council or board of authority; fourth, by adoption of those perfected by the National Conference on Weights and Measures; and fifth, by combination of two or more of these ways. I shall not dwell at any length on the advantages and disadvantages of these methods but do call your attention to some of the so-called "high spots."

Under circumstances mentioned in class 1, if a condition should arise as a result of progress or otherwise which needs to be regulated, the weights and measures official must wait until the legislature meets, and prove to the representatives the necessity of such a regulation (a rather difficult task) before he is able to cope with the situation—unless fraud is being perpetrated in which event he at all times has power to intervene.

The second class or system has considerable advantage over the first in that the enforcing officer is able to make rules or regulations immediately upon demand; yet the advisability of vesting so much power or authority in one man has been questioned. He is, by act of the legislature, given the power to make and enforce his own laws, being vested with police powers and backed with State authority. No other officer has such power, not even the Governor himself. He has the power to prosecute and even to persecute, though unintentionally and without prejudice, depending upon his knowledge of facts and conditions and his ability to cope with the situation. There is no record of such an official usurping such power to his own aggrandizement or for advancing his own political aspirations or prestige, and I do not believe there is a weights and measures official anywhere in these United States who would take advantage of such authority. Nevertheless, the fact remains that under such a set-up there is the possibility of developing an autocratic system and of bringing about criticism.

Digitized by Google

Rules and regulations promulgated under the third method, by a board of authority or council, is more democratic than the second and there is less tendency toward autocracy, in that, as a general rule, before any rule, regulation, or ordinance is put into effect a public hearing is granted, giving all parties concerned an opportunity to express their views, both pro and con, thus assuring fair and just rulings. Yet in a good many instances the board of authority or council is largely influenced by the recommendations of the enforcing officer and acts accordingly. Such action can be explained partly by the fact that the board or council is none too well informed regarding the details of weights and measures activities, nor of circumstances which would warrant new or additional regulations, and therefore naturally relies upon the sincerity, the judgment, and the ability of the enforcing officer for guidance in its actions.

In the fourth class—that of adopting rules and regulations promulgated by the National Conference on Weights and Measures and recommended by the National Bureau of Standards—advantage is taken of the combined interest and experience of those who have studied and are best acquainted with weights and measures problems and how to deal with them. Members of this Conference are men who are whole-heartedly interested in developing and advancing the cause of weights and measures without prejudice, in a manner best suited to the needs of the people concerned, in bringing about just and fair practice in trade, and in endeavoring at all times to put an end to the use of weighing or measuring devices in the perpetration of fraud, deception, or trickery. Upon first thought it would seem that such a system would be best of all, yet let us note the disadvantages. The Conference meets once a year and not always that often. According to procedure practiced thus far by the Conference, the necessity for a new regulation is presented to a committee, who after hearing the facts and studying the circumstances and conditions involved, promulgate a regulation and present it to the Conference for discussion. If adopted, it is adopted tentatively and lies on the table for 1 year subject to further study by all concerned, to be finally adopted at the next succeeding Conference. It is then recommended by the National Bureau of Standards for acceptance and adoption by the various weights and measures departments of these United States, effective on some fixed date, which often is a year later. Thus, you see, the disadvantage here is the same as noted under class 1 already shown.

We now come to consider class 5, a system of combining two or more of the foregoing set-ups. Upon careful study of the different ways of making rules and regulations it is concluded this system is more nearly ideal than any. It is more adequate, more flexible, and more democratic; that is, if the combination consist of systems 3 and 4 already mentioned, the disadvantage of one is offset by the advantages of the other, and vice versa. It is suggested that every weights and measures man here who operates under a different set-up give this serious thought, and if in agreement, set about to get his law so changed as to adopt the rules, regulations, specifications, and tolerances promulgated by the National Conference on Weights and Measures and recommended by the National Bureau of Standards; provided however, that such additional rules and regulations as are needed to carry out the intent of the law—which is to protect the

Digitized by Google

purchasers of any commodity—shall be promulgated by the commissioner, superintendent, or enforcing officer of weights and measures and adopted by the board of authority. This is the system in force in my State, North Carolina, and it is very satisfactory. In short we adopt the rules and regulations promulgated here if we like them and they meet the requirements and needs of our people according to the intent of the law, and if we don't like them, or they are inadequate, we make our own rules and regulations. Thus we have a very flexible system, able to keep abreast with the progress of the age and to cope with any situation that may arise.

Proof of a theory is its application and consequences. I therefore cite you to results obtained under such a system by the State of North Carolina, though there are other States with similar experiences. In 1931 the North Carolina General Assembly adopted system five, as just explained. Very soon thereafter a question arose relative to the sale and distribution of weighing and measuring devices. Practically every department of weights and measures in the land requires the enforcing officer to "keep a general supervision of the weights and measures and weighing and measuring devices offered for sale, sold or in use" in the territory he supervises. We found no record of a regulation having been adopted or recommended by the National Conference. Therefore, under the mandates of the law our board promulgated what is known as "regulation no. 7", which requires all weighing and measuring devices offered for sale, sold, or distributed in North Carolina to be first submitted for test and approval. The heart and soul of our law is to protect the person who is unable to protect himself, in relation to weights and measures. Thus this regulation was to prevent the sale and distribution of such devices as would aid in the perpetration of fraud or deception in their operation or use and thus would ultimately be caught and condemned while in the possession of an innocent offender of the law. This regulation was put into effect in August 1931, and I might add that between 2,900 and 3,000 weighing and measuring devices have been submitted for test with less than 2,000 approved. Next came the ice problem known as "scored" ice. We recognized the merits of this and made regulations accordingly. Every one here has had more or less trouble with coal deliveries and North Carolina was no exception. The so-called "club car" purchase was becoming a "racket"; in fact it was a nuisance. This practice was carried on under the guise of collective bargaining and defended by claiming it was within the private rights of individual citizens, but we found that the private citizen was being preyed upon. The agent or solicitor for carload purchases was not only taking no part of the coal so purchased, but was delivering by estimated weight around 5 to 10 tons in excess of bill-of-lading weight resulting in a profit to said agent or solicitor handling a 50-ton car (they usually ordered small cars) of his regular commission on 50 tons, the short weight and sale of an additional 10 tons, and delivery charge on 60 tons. So regulation no. 9 was promulgated, which takes care of the situation so far as law is concerned.

In turn, questions and conditions arose requiring a ruling or regulation on the visibility of scales; net weight; what constitutes a package; when is a gallon of gasoline a gallon; bulk hauling of petroleum products; vehicle or truck tanks, and bulk plant meters. I mention these to show the efficiency as well as flexibility of our law,

Digitized by Google

rules, and regulations in carrying out the purposes and intent of said law and in taking care of new conditions resulting from progress.

Summing up and observing from a national viewpoint, it would seem most advisable that every weights and measures office, whether large or small, should take such action as may be necessary to enable it to acquire full benefit of the combined knowledge, experience, and advice of the men who constitute the National Conference on Weights and Measures. Such men above all men are best qualified for advising. Free from prejudice or personal gain, they have but one motive, one purpose, and one aim in all their acts, and that is to protect the purchaser. In response the Conference should realize the importance and the seriousness of, and should respect, the trust and power vested in it, and should hedge itself about with such rules and regulations governing its own procedure and actions as to warrant such trust and respect.

In conclusion, with rules and regulations promulgated by the National Conference on Weights and Measures and recommended by the National Bureau of Standards, and with power to add to or reject by State or local authorities—thus upholding the sovereignty of the State and of States' rights and the right of local self-government recognized and sanctioned jointly and severally by State law—the weights and measures department can be and will be a power and a glory in any community where it operates. It will have the respect and good will of all the people and those who carry on the work will be honored and duly rewarded for their efforts.

The CHAIRMAN. Thank you, Mr. Baucom.

THE LABELING AND CERTIFICATION PLAN IN CONNECTION WITH FEDERAL SPECIFICATIONS

By A. S. MCALLISTER, *Assistant Director, National Bureau of Standards*

Mr. Chairman, ladies, and gentlemen, many persons unfamiliar with the official duties of the Bureau and its relations to Congress, have been led to believe that the Bureau is accepting money collected from the public in the form of taxes while failing to give to the public the benefit of information acquired by it at the expense of the taxpayers.

Congress is the official agency elected by the people to look out for their interests, with special reference to the expenditure of the peoples' money for governmental services. An examination of the functions of the National Bureau of Standards as laid down by Congress, the appropriations made by Congress for the activities of the Bureau, and the official records of the Bureau's accomplishments will show that the Bureau is performing its functions in a manner thoroughly satisfactory to Congress.

Numerous groups interested in the problems of the "consumers"—meaning "over-the-counter" buyers as distinguished from contract buyers—are inclined to request from the Bureau services which it is neither authorized nor able to render. Congress has not seen fit to empower the Bureau to render the services demanded by these groups. However, within the limitations placed by Congress on the services of the Bureau, this agency carries on many activities of direct and determinable service to the consumers—both contract and over-the-counter buyers.

Digitized by Google

The Need for Quality Specifications.—If all buyers could become expert in the identification and purchase of all groups of commodities, and could keep continually posted on changes and improvements introduced in all branches of industry, there would be little need for quality specifications. Only when a person can specialize on the purchasing problems in a single industry, that is, can become qualified to serve, for example, as the purchasing agent for one of the many parts in a general department store, can he be considered sufficiently expert to have little need for standards of quality. Incidentally, let me say that the most expert of such experts are depending more and more upon definite specifications to record conclusions based on their experience and guide their judgment. Moreover, they augment their own personal inspecting facilities by elaborate testing services.

If a lifetime devotion to a single group of commodities is required to educate an expert buyer in a limited field, there can be no doubt that the person who does merely incidental buying cannot possibly become expert in all commodities and he will seldom be rated as an expert in even one line.

Inexpert buyers (and that grouping includes all of us so far as concerns the great majority of commodities) need the aid of standards to guide them in determining what qualities certain commodities should possess and in identifying commodities possessing these desirable qualities.

Contract buyers, those who purchase large quantities of certain commodities on definite written contracts, can set forth their requirements in the form of specifications submitted to competitive bidding and are in position to tell the manufacturers just what they want and to determine by means of tests whether the commodities delivered comply with the specification requirements. To a certain extent over-the-counter buyers benefit from the quality standards established by contract buyers in cooperation with the producers in case the commodities are properly identified as complying with the specification requirements.

In the work of selecting satisfactory specifications and establishing satisfactory means for identifying commodities complying therewith, all organized groups of purchasers, both contract and noncontract, can appropriately take a very active and effective part. From the point of view of noncontract purchasers, that is, over-the-counter buyers, identification of commodities satisfactory for their uses is of outstanding importance. It is in connection with the preparation of specifications and the identification of commodities complying with specification requirements that the National Bureau of Standards can be most helpful to consumers.

Testing at the National Bureau of Standards in Relation to Over-the-Counter Buying.—The United States Government uses specifications in purchasing its supplies. Each specification lists the required properties of the article which is being purchased. In supplying rope, for example, the requirements of the specification as regards the kind of fiber, the diameter, the weight per foot, the oil content and the breaking strength must be met. No brands or trade names are used in the specification and any manufacturer who can supply the article with the required characteristics is free to bid. This eliminates favoritism and promotes free competition.

Digitized by Google

The order goes to the lowest bidder, and the goods are tested after delivery to determine whether or not they meet the specifications. A large amount of testing of this kind is carried out for the Federal Government by the National Bureau of Standards. If the material meets the required tests this closes the transaction. If not, the procedure is repeated with the next lowest bidder.

It will thus be seen that in a transaction involving bids from perhaps a dozen manufacturers the product of only one or two is actually tested. This saves an enormous amount of time and labor, but gives little or no information about the relative value of the products of the various manufacturers. It does not tell which is the best. It says only that a product has been found which meets the specification—that it is good enough for the Government's requirements.

Some people have thought that because the National Bureau of Standards does a large amount of testing for the Government, it should be in a position to say which is the best of any group of products, or to arrange these products in order of excellence. It will be seen that the testing procedure actually followed does not give this information, and that the Bureau's knowledge of a whole line of competing products is necessarily very limited.

The Bureau has occasionally been urged to extend its tests to include whole lines of competing products, and to make the results of its tests available to consumers. The Bureau has neither authority nor funds to do this. Bills which would authorize work of this kind have been introduced in Congress, but they have never found congressional favor. Admittedly it would be a very costly undertaking, and would involve continuous testing on an enormous scale in order to report changes up or down in the quality of goods.

Since the use of specifications is not practicable for most of us who buy our goods over the counter, the Bureau has done what it could to encourage the use of a procedure which would secure for the over-the-counter buyer the advantage of quality specifications similar to those which the Government utilizes.

To the numerous requests from consumers, both organized and unorganized, for data concerning trade-branded goods tested at the National Bureau of Standards, the publication of which would be welcomed by many and opposed initially by few, we have given serious consideration. Our conclusion has been that, under the limitations imposed upon us, the best method of giving the public the benefit of our tests and investigations is to place the results of our research at the disposal of committees formulating nationally-recognized specifications and to encourage firms to manufacture goods to comply with these specifications, and purchasers to buy specification-made goods.

The Certification Plan.—The method employed by the Bureau in making available the essential information has been the development of the so-called "certification plan", which involves the compilation and distribution of lists of manufacturers desirous of obtaining contracts based upon certain selected nationally-recognized specifications, and willing, when requested to do so, to certify to the purchaser that the commodities delivered are guaranteed to comply with the requirements and tests of the specifications. This plan has been applied to 460 Federal specifications and commercial standards, more than 18,200 requests for listing having been received from about

Digitized by Google

10,000 firms. Copies of these lists are sent to all interested tax-supported agencies and are available to others upon specific request.

The reception given to the certification plan by responsible manufacturers and representative trade associations has been very encouraging. It is being widely utilized by "public purchasers", that is, purchasers for the Federal, State, and municipal governments who are spending the money collected from the public in the form of taxes. It is also being welcomed by other large purchasers, the purchases of which are of such magnitude as to justify the use of specifications.

Many of the specifications to which the certification plan has been, or will be, applied cover commodities of much interest to over-the-counter buyers. Although it is not expected that such buyers will actually purchase commodities on individual specifications, some day they may be induced to confine their purchases of certain kinds of commodities to those known to be manufactured to comply with certain nationally-recognized specifications. They may even now be induced to examine critically such of these commodities as they do purchase to determine whether or not they are as represented and will comply with the buyer's individual requirements—to purchase on the basis of real quality and ability to meet service requirements rather than on the basis of superficial appearance or of the numerous kinds of sales arguments.

The Labeling Plan.—For the purpose of bringing to the attention of the over-the-counter buyer most effectively at the time of making purchases, such commodities as are manufactured to comply with nationally-recognized specifications, use is being made of a self-identifying, quality-guaranteeing labeling plan which represents an important step in expanding the mass-production, mass-distribution, mass-consumption idea.

Experience in the use of self-identifying, quality-guaranteeing labels and correspondence relating thereto indicate strongly that it is possible to educate the public to look for quality labels.

In accordance with the self-identifying, quality-guaranteeing labeling system, a firm desiring to bring effectively to the attention of the over-the-counter buyer at the time of making a purchase, commodities which it is willing to guarantee as complying with the requirements of certain nationally-recognized specifications or standards, placed on the individual commodities or their containers labels which definitely identify both the specification and the manufacturer or the trade association which holds itself responsible for the guarantee.

Among the aims and objects of the self-identifying, quality-guaranteeing labeling plan are: (1) To assist the manufacturers and dealers in obtaining the maximum benefit to be realized from the mass-production, mass-distribution, and mass-consumption of such of their commodities as comply with the requirements of nationally-recognized specifications; (2) to encourage the small-quantity over-the-counter buyer to purchase staple goods guaranteed to comply with such specifications; (3) to pass along to the over-the-counter buyer (the nonspecifications using public) some of the benefits derived by the contract buyer from using nationally-recognized specifications under the certification plan; and (4) to give to the individual consumers as well as the organized producers, the benefit of tests and investigations by placing the result of research at the disposal of committees formulating nationally-recognized specifications (which

Digitized by Google

may or may not be those of the Federal Government) and encouraging firms to manufacture goods to comply with these specifications, and purchasers to buy specification-made goods.

Certain manufacturers have stated that they are now using or planning to use quality-guaranteeing labels, or their equivalent, with goods manufactured to comply with Federal specifications for brooms, dental alloys, dry cells, fireproof safes, gypsum, ink (writing, colored, and indelible), library paste, lime, linoleum, lumber, paint, paper (correspondence, carbon, blue print), pipe, portland cement, rope, soap, textiles, and wall board.

Attention is directed to the essential and significant features of the self-identifying, quality-guaranteeing labeling plan at the general conferences of the industries giving consideration to proposed commercial standards. Manufacturers desiring to do so are encouraged to identify by suitable labels such of their commodities as they are willing to guarantee as complying with certain designated commercial standards.

Through its contacts with organized and unorganized producers and distributors, and through cooperation with many groups of governmental and nongovernmental consumers, both contract and over-the-counter, the National Bureau of Standards can and does aid materially in determining the acceptability of certain standards to all interests concerned and in obtaining national recognition for standards that are accorded adequate acceptance.

The CHAIRMAN. I thank you, Dr. McAllister, for your instructive paper.

DEMONSTRATIONS OF RECENT DEVELOPMENTS IN WEIGHING SCALES, BY REPRESENTATIVES OF MANUFACTURERS

SECRETARY'S NOTE.—At this point several manufacturers brought before the Conference samples of scales embodying new design features, and demonstrated them to those in attendance. Particular attention was given to the new features incorporated, the method of manipulation of the adjustments provided, and the answering of questions asked by members. As was the experience in former cases, it was found that many of the remarks made are of no value to a reader when a sample of the product is not before him, and thus no good purpose would be subserved in printing such material here. Consequently it has been decided to omit this material from the report.

It may be noted that such demonstrations as these, which familiarize the delegates with new apparatus, are of great interest and value to them. Attendance at the Conference is the only way in which full advantage can be obtained from program features such as this. The delegates were duly appreciative of the efforts of the manufacturers who took part in this demonstration.

APPOINTMENT OF COMMITTEES

THE CHAIRMAN. Now, gentlemen, the regular procedure is for the chair to appoint two of the Conference committees: The Nominating Committee and the Committee on Resolutions. So at this time, the Chair wishes to announce the following:

Committee on Nominations—J. C. Tinkey, of Ohio, chairman; H. N. Davis of Vermont; Rollin E. Meek of Indiana; John S. Burke, of Jersey City, N. J.; and Howard E. Crawford, of Jacksonville, Fla.

Committee on Resolutions.—C. D. Baucom, of North Carolina; John J. Levitt, of Illinois; George S. Barnard, of Michigan; Walter F. Stiles, of Connecticut; Alexander Hamilton, of New York, N. Y.;

Digitized by Google

Wm. F. Steinel of Milwaukee, Wis.; and Jacob M. Vanderslice, of Philadelphia, Pa.

ANNOUNCEMENTS

(At this point the secretary announced that the report of the Committee on Specifications and Tolerances on modification of the code for vehicle tanks was available for distribution; also that the large-capacity scale-testing equipment of the department of weights, measures, and markets of the District of Columbia was parked outside the building, and that the delegates and guests were invited to inspect this equipment.)

(At this point, at 12:55 p. m., the Conference took a recess until 2 p. m.)

Digitized by Google

FOURTH SESSION—AFTERNOON OF WEDNESDAY, JUNE 5, 1935

TOUR OF THE LABORATORIES OF THE NATIONAL BUREAU OF STANDARDS

(The afternoon session of the Conference consisted of a visit to the various laboratories of the National Bureau of Standards, particular attention being devoted to the Division of Weights and Measures. In order to make the trip of maximum interest and helpfulness, the delegates and guests of the Conference were divided into small groups, each group being in charge of a member of the staff of the Bureau.)

Digitized by Google

FIFTH SESSION—MORNING OF THURSDAY, JUNE 6, 1935

(The Conference reassembled at 10:17 a.m., at the National Bureau of Standards, Mr. John P. McBride, presiding officer, in the chair.)

RECONSIDERATION OF ADOPTION OF SPECIFICATION 9 FOR PERSON WEIGHERS

The CHAIRMAN. Gentlemen, in relation to the action taken yesterday on the code covering person weighers,[9] the decision of the Conference, as indicated by the vote taken, was that the whole code would be accepted as recommended by the committee. As you will recall, there was some discussion that occurred at various times in relation to specification 9, as to whether that specification should be adopted as retroactive or as nonretroactive. Some confusion appears in the minds of those who were present as to which action was finally taken.

Now to clarify the situation and so that there may be no misunderstanding, the chair will entertain a motion to reconsider the vote of yesterday in relation to person weighers, so far as specification 9 is concerned. Having obtained that reconsideration, we may then take a positive vote on specification 9. I think that we should do that so that the record will be unequivocal.

Mr. GRIFFITH. Mr. Chairman, I will make that motion.

(The motion was seconded, the question was taken, and the motion was agreed to.)

The CHAIRMAN. We are now ready, gentlemen, for reconsideration of our vote in relation to specification 9, reading as follows:

9. A ticket person weigher shall be so designed and constructed that throughout a period when the supply of tickets is exhausted, any coin which is inserted will be returned to the user through automatic delivery to a suitable receptacle on the outside of the person weigher, or the insertion of a coin in the coin slot will automatically be prevented.

The question we want to settle is whether or not this section will be adopted to be retroactive or nonretroactive.

Now if someone will present a motion to the effect that this specification be retroactive or that it be nonretroactive, we can take a vote which will close that situation up at once.

Mr. GRIFFITH. Mr. Chairman, we have been enforcing the code on person weighers since 1932 in our jurisdiction. We have found that one make of ticket person weigher does not contain a device to return the coin at the present time. The other scales are now equipped with a device to reject a coin or to make the scale inoperative when the tickets are exhausted.

In the particular scale in question a full supply of tickets numbers 10,000, which is a very large supply. In the ordinary course of business, the operator or the sealer can readily discover when the supply is nearly exhausted, and the machine can be reequipped with

[9] See pp. 17-18, and 34-35.

34678—36——5

Digitized by Google

a supply of tickets. Our experience and records show that this seems to be taken care of.

I believe it will not be contrary to good administration to make this section nonretroactive. I therefore move you, Mr. Chairman, that specification 9 be made nonretroactive.

(The motion was seconded, the question was taken, and the motion was agreed to.)

DEMONSTRATIONS OF RECENT DEVELOPMENTS IN WEIGHING SCALES, BY REPRESENTATIVES OF MANUFACTURERS—Continued

(See secretary's note on page 46. At this point this program item was concluded.)

NONTAX-PAID GASOLINE

By S. H. Wilson, *Oil Chemist, State of Georgia*

A few years ago the tax-raising agencies of the various States decided to enter the then unexplored and, what has subsequently proven to be, most lucrative field of taxation, namely, that of petroleum products. Following this they almost immediately doubled, and in some instances trebled, the amount of tax levied per gallon, thus in many instances making the tax more than the product itself is worth at the point of production. Then and there they created the incentive for the gasoline bootlegger. I submit to you that when you create a condition such that a man can make as much as $500 in the handling of one car of gasoline, by simply failing to do something that he did not want to do in the first place and something that he knows all of his competitors are required to do, you have a condition which none but the pure in heart can face without faltering. So we have the gasoline bootlegger and he, like all other bootleggers, has proven himself to be a most troublesome individual. In fact our efforts to subjugate him have been of such little effect that sometimes I fear that we are going to have to refer to him in somewhat the same language we use in referring to our poor, and say, "The bootlegger we have with us always."

All bootleggers are tax evaders, but not all tax evaders are bootleggers. They might be so termed under a broad interpretation of the word, but in my opinion the bootlegger is one who sells his products in violation of law and without regard for the quality of his goods—in fact, without regard for anything, his business being of a temporary or fly-by-night nature. The tax evader however, may have an established place of business and, although he is selling in violation of law, he may take a certain pride in the quality of his goods and in correct measure, with the idea of continuing in business for awhile, at least. It is this temporary character of business and the utter lack of responsibility together with inadequate and no doubt inaccurate measuring equipment, that makes the bootlegger of interest to the weights and measures officials.

In a short paper such as I am presenting to you at this time, it will not be possible to do more than approach the subject of tax evasion; and in doing this I am going to confine myself to outlining one or two of the tricks of the evader that have come under my observation in the enforcement of our regulatory law in Georgia. Before doing this, however, may I outline to you, briefly, the setup of our motor-fuel tax-collecting agency?

Digitized by Google

We do not have many of the problems that I am sure some of the officials of other States are confronted with. For instance, we do not produce any petroleum; we have only one refinery, this being at Brunswick, and they are in sympathy with our law and cooperate with us whole-heartedly. We allow no tax exemptions, except to the Federal Government. All our wholesalers are bonded.

Common carriers are required, by law, to report to us all shipments of gasoline; in addition to this the refinery must report all shipments to our State. It is obvious, however, that we cannot enforce this latter provision strictly as these refineries are out of our jurisdiction, so we do not attempt to do it by force, but by asking for it and by being nice about it. We require all wholesale dealers in our State who receive shipments, to report them to us. Thus, you see, we have a three-way check on all shipments coming into our State and we have found by experience that the carriers, that is the railroad companies, are the most accurate. It is hard to find an instance where all three of these agencies fail to report a particular shipment at the same time. This gives us a starting point for tracing any car that might be in question.

Under our regulatory law, whenever a shipment is received in our State, the dealer, before unloading, must draw a sample of the product received and submit it with all data, such as refiner, car initials, car number, number of gallons, etc., to the laboratory for analysis. Then, we have six inspectors traveling over the State, drawing samples and inspecting pumps. These men make daily reports to the laboratory. We have two clerks, one who checks gallons received in the State and the other checking tax-paid gallonage. One auditor in our immediate office and a corps of men from the State auditor's office check all delinquent taxes. Still in spite of all this we have some tax evasion. A large percentage of this can be accounted for, as follows. When our law was enacted, the various counties and most municipalities were buying gasoline in tank car lots. They claimed, at that time, that they were exempt and refused to pay the tax. Litigation was started to clear the matter up, but it took time to put it through. In the meantime, buying continued so that when we did finally get a favorable decision large sums of money were owing the State and we have found it difficult, in some instances, to make collections.

In the enforcement of our regulatory law we sometimes find it necessary to condemn a car of gasoline or kerosene on account of failure to meet our specifications. The cars have not been unloaded and are technically still in possession of the refinery. We allow the refinery to withdraw such a car from our State. We, of course, trace the movement of this condemned car through the railroad records in order to see that it is taken out of the State. We have found instances where dealers have tried to take advantage of this situation, in order to evade taxes. I recall one such instance. A car of gasoline had been condemned and ordered shipped out of the State. The dealer came in a few days later, apparently all excited and told this story. "You remember that car you condemned for me the other day?" I replied that I did. "Well," he said, "this morning while I was away from my place the railroad picked it up." "Well", I said, "what did they do with it?" "They have already shipped it out." I asked him if he unloaded it before they pulled it and he said "No, absolutely, it went out full, just as it came in." In taking the matter up with the

Digitized by Google

railroad, it developed that the car had been gone several days and that the railroad company insisted that the car went out empty. We finally obtained permission from the proper authorities to have the car stopped and inspected and it, of course, was found to be empty.

Another instance of a little different form of evasion is, when a dealer buys a car of inflammable distillate and does not report it or submit a sample from the car before unloading, claiming that the law only requires him to submit data and samples on gasoline and kerosene. This distillate, which, of course, is a naphtha, is worked off gradually in his gasoline. Thus, you see if he gets away with it, he picks up another car of gasoline, tax free.

Then we have the dealer who runs several stations, one of which is near the State line. He is selling in both States and paying taxes in both States. Then one day he loads at the border station and reports to his State that he is delivering to a neighboring State and claims exemption, when, in fact, he is delivering to one of his own stations, thus evading the tax unless eventually caught through the interchange of information between these two States. In Georgia, the dealer pays tax on what he sells and not on the amount he buys. This makes it difficult in some instances to determine what a dealer owes and make it possible for one to carry on a practice such as I have outlined.

One of the most difficult problems that we are having to deal with now is the tractor-fuel problem. In defining motor fuel for taxation, our law names certain substances and then continues, "but shall not include any such product which has an initial boiling point of over 200° F, when determined by the distillation method as prescribed in United States Bureau of Mines Technical Paper 323 B." Dealers are now bringing in tractor fuel with initial boiling points of 205 to 210° F, and end points of 325 to 360° F. These special products, in some instances, have a gravity of 58 API. They are nontaxable, but you can see the possibilities in the hands of an unscrupulous dealer.

The problem of dealing with tax evasion is becoming more difficult as the improvement of roads and motor vehicles go hand in hand in making it possible to move large gallonage over long distances by motor trucks.

I am told that 90 percent of all bootlegging is done at night. There is an understanding between the bootlegger and the dealer, and the latter knows, of course, about when the bootlegger is coming. If such a dealer wants gasoline delivered, he leaves a light in the station as the proper signal and then also leaves the filler pipe unlocked. The delivery is made while the attendant is at home in bed and settlement is made later.

Gasoline is being trucked into Georgia from various ports in Florida. From the refinery at Mobile, gas moves by small barges to such points as Freeport and St. Marks, and later by motor to various points in our State. Shipments also come of course, from marine terminals at Jacksonville. The longest haul, however, that has come to light, up to the present time, was from Bowling Green, Ky. This was a bootlegging proposition and was promptly brought to light and stopped through the enforcement of our regulatory law, the gasoline failing to meet our specifications. The dealer was caught with a considerable

Digitized by Google

gallonage on hand. We permitted him to move this gasoline from the State, but required a receipt from the purchaser. Some of the gas was returned to the refinery and receipted for by them. However, quite a bit of it went into the hands of that distinguished legal personage, John Doe, who at that time seemed to have been a resident of the State of Alabama.

If I may be permitted to do so, I would recommend, in order to discourage bootlegging as much as possible, that the tax-collecting agency be a part of, or closely associated with, the regulatory unit of each State. By such arrangement, information with reference to the character of any product in question, and other information such as the condemnation or withholding from sale of any lot, is immediately known to the tax officer.

Auditors should stick all storage tanks at the time of making the initial audit in order to have a definite starting point and then should work continuously from this point.

There should be an interchange of information each month between adjoining States. Laws should be enacted prohibiting the delivery of taxable petroleum products to the retailer after certain hours at night and before certain hours in the morning. All trucks engaged in the transportation of such products should be compelled to register with the tax collector and drivers of such trucks should have papers showing all necessary information with reference to any particular load. Prominent highways leading from one State to another should be patrolled.

All dealers should be bonded and bonds should be forfeited—thus promptly putting the offender out of business—when he fails to pay taxes as a result of dealing with questionable characters. Eternal vigilance is the watchword if you are going to make the business of the gasoline bootlegger unprofitable in your State.

THE CHAIRMAN. Thank you, Mr. Wilson.

REPORT OF SPECIAL COMMITTEE ON RESOLUTIONS, PRESENTED BY WALTER G. WHITE

Your committee reports a special resolution and moves its adoption.

IN MEMORY OF JOHN H. AUSTIN, OF MAINE

Whereas as a result of the untimely and unfortunate accident, causing the death of our respected coworker from the State of Maine, Mr. John H. Austin, a cloud of sorrow has been cast over this conference, and

Whereas due to the great distance traveled by many of our members, it is impossible to close this convention as a fitting tribute of our deepest regret, and

Whereas it is the wish of this convention to express to the family and the weights and measures department of the State of Maine, our sincere sympathy in their bereavement at the loss of loving husband, father, and respected official: Therefore be it

Resolved, That this body, in convention assembled at Washington, D. C., this sixth day of June, one thousand nine hundred thirty-five, do unanimously adopt this resolution and have it spread upon the minutes; and be it further

Resolved, That a copy of this resolution be forwarded to the family of John H. Austin and the Department of Weights and Measures of the State of Maine.

(The resolution was duly adopted.)

Digitized by Google

TEMPERATURE OF GASOLINE IN UNDERGROUND STORAGE

By B. W. RAGLAND, *Chief, Bureau of Weights and Measures, Richmond, Va.*

Mr. Chairman, ladies, and gentlemen, one of the duties of the Richmond bureau of weights and measures is the supervision of motor-fuel deliveries both as to quantity and quality. This inspection does not cost the taxpayer a cent and helps pay the operating expenses of the weights and measures division. The cost per capita for services rendered to the buying public is less than a 3-cent postage stamp.

We are often asked, "How can you do this vast amount of work at such a low cost?" It is against the laws of Virginia to charge a fee for testing weighing and measuring devices, but not against the law to charge a fee for testing the quality of various commodities. We charge a fee, based on the amount of motor fuel brought into the city. Last year we tested samples representing 109,668,030 gallons of fuel. These duties naturally brought to our attention the methods used by the several oil companies in the delivery of their products to the service stations.

The large number of service-station operators complaining of a supposed shortage in these deliveries made us feel that there was something wrong. As we require all delivery trucks to be marked with the shell capacity of the several compartments on both sides of each dome and knowing that service stations had the privilege of checking these deliveries, we looked for the cause of these complaints from other sources. We noticed that all of these complaints originated from service stations served by major oil companies who used gage sticks for fixing inventories. Frequently the shortage amounted to $20 per inventory.

The question of temperature was offered as the cause of the trouble. We determined to see just what part the temperature of the underground tank played in this supposed shortage. A 9-week period of our average weather conditions was selected to determine if Mr. Service Station Dealer was the loser or gainer when he received his motor fuel from the oil company's tank wagon.

Normal summer temperatures were taken advantage of, as well as extremely low winter temperatures in order that no condition which might cause a loss or gain might be overlooked. Extreme summer temperatures were taken into consideration and a thorough check made of the underground-tank temperatures. In this location, when the atmospheric temperatures are high, underground temperatures are also high, and in many cases higher than the atmospheric temperatures. As an example of this, we found the atmospheric temperatures to be 70° F, and the underground temperatures to be as high as 80° F, in several tests made. This condition would not cause the supposed summer loss due to the temperature but, on the contrary, would cause a gain to the service station.

We first took the temperature at the bulk plant, then proceeded to accompany the truck to the point of delivery where the temperature was again taken of the motor fuel in the tank. The temperature was then taken of the fuel in the underground tank. The delivery of fuel was then made and again the temperature was taken of the underground tank at the completion of delivery. The following data sheet gives a picture of what Richmond, Va., finds to be the true case. Loss or gain, which?

Digitized by Google

Date	Time (a. m.)	Temperature of air	Weather	Temperature of—			Fuel in ground tank		Service-station fuel loss or gain due to difference in temperature between wagon and ground tank
				Tank wagon at time of delivery	Ground tank before filling	Ground tank after filling	Before filling	After filling	
1934		°F		°F	°F	°F	*Gallons*	*Gallons*	*Gallons*
Oct. 11	10:00	70	Clear	74	75	76	125	725	+0.72
16	11:00	68	do	66	73	66	28	628	0
23	10:00	63	do	66	70	68	280	551	+.33
30	10:00	49	do	59	66	62	185	473	+.52
Nov. 6	10:00	57	do	59	69	62	350	1,000	+1.17
13	10:00	37	do	46	57	57	477	735	+1.65
22	10:00	68	do	58	62	60	125	326	+.24
27	10:00	46	Rain	50	59	57	375	528	+.69
Dec. 12	10:00	25	Clear	42	55	45	176	1,016	+1.51

[NOTE.—The distance of haul on which data were based was 0.8 to 5 miles]

On tank-car deliveries the oil distributors make the necessary temperature correction, the transfer being made on the accepted basis of 60° F. The loss or gain on a smaller delivery is so slight that it is a matter of little concern.

We believe the chief cause of nearly all the complaints in Richmond was due to the abominable gage stick. Authorities admit the best hoped for when using the gage stick is approximation. Our bureau refuses to approve it, and therefore does not seal them. The Virginia weights and measures law prohibits the use of unsealed weights or measures. All oil companies in Richmond have stopped the use of these gage sticks as a method of fixing inventories, and complaints as to short deliveries have stopped.

The CHAIRMAN. Thank you, Mr. Ragland.

Mr. WALDMAN. Would the depth of the tank have anything to do with the temperature?

Mr. RAGLAND. In Richmond we require tanks to be put in 6 feet deep. They have a three-foot clearance above the top. All of our tanks are supposed to be put in identically the same.

GASOLINE LOSSES IN STORAGE AND HANDLING

By H. C. DICKINSON, *National Bureau of Standards*

Mr. Chairman, ladies, and gentlemen, gasoline differs from most of the products which are measured or weighed in that some of it can escape by evaporation in the process of handling. This is further complicated by the fact that the volume of the gasoline changes considerably with change of temperature. Thus the accurate measurement of gasoline by volume presents difficulties which are not generally very well understood and lead to controversy on points which could be readily settled if the facts were known.

In matters of measurement as such, you are so much better informed than the writer that we shall assume in this discussion that the measuring and weighing devices used are correct, and shall deal only with those factors which either account for real losses of gasoline or for apparent losses or gains despite the correctness of the measuring devices themselves.

Evaporation Losses.—Losses of gasoline by evaporation take place whenever gasoline is exposed to the air. Such conditions, however,

Digitized by Google

are so carefully avoided for the sake of safety in the usual methods of handling gasoline that we need not discuss the matter here. In any case such losses are so variable as to be beyond any reasonable estimate.

This leaves for consideration the losses which may occur in storage tanks or in the filling and emptying of them. Such losses will depend on: (1) The vapor pressure of the gasoline, which differs considerably among commercial products; (2) the temperature within the storage tank; (3) the volume of the open space in the tank above the gasoline; and (4) the amount of air circulation into and out of the tank.

Gasoline is a mixture of volatile fractions of petroleum. The usual product has a flash point which is not commonly measured because it is much below ordinary atmospheric temperature. The flash point is that temperature at which a sufficient amount of the product will evaporate to form an explosive mixture with air. Ordinary commercial motor gasoline will produce explosive vapors at all ordinary temperatures. This is one of the important elements in the problem of safety. Gasoline vapor is practically always explosive in the open air, but not so in closed tanks.

A more significant test than the flash point which is commonly applied to gasoline is the Reid vapor-pressure test, originally designed to indicate safety of handling the product in closed containers. This test shows approximately what pressure the gasoline vapor would exert if a tank one-fourth full of liquid gasoline were heated to 100° F. For commercial gasolines this pressure may range from 8 to 12 pounds per square inch. Gasoline having a vapor pressure of 8 pounds or less is generally suitable for use in hot weather, while those of higher pressures are generally marketed in cool or cold weather. The trade practice in this respect is controlled by the tendency of too volatile gasoline to "vapor lock" or form vapor in the fuel systems of automobiles and cause stoppage or irregular behavior of the engine.

It should be noted that the Reid vapor pressures indicated by test are the pressures produced by the gasoline vapor and do not include the normal atmospheric pressure of about 15 pounds per square inch. Thus, if the vapor pressure were 15 pounds by this test, the gasoline in question would begin to boil at about 100° F where the pressure produced by its vapor equaled the atmospheric pressure.

Vapor-pressure measurements make it possible to calculate some of the losses of gasoline vapor which take place under varied conditions of handling.

If gasoline partially fills any vented tank and remains at a constant temperature below its boiling point, i. e., below 100 to 150° F. and at a constant barometric pressure evaporation will occur as follows: Gradually a sufficient amount will evaporate to saturate the air originally in the container above the gasoline. In this process the air and vapor will expand somewhat and a small part of the mixture will escape by way of the vent.

When equilibrium has been reached, there will be no further escape of gasoline vapor, except such as takes place by quiet diffusion from the end of the vent pipe. If the vent is as small as practicable, losses of gasoline under these conditions are extremely low, in fact usually negligible.

However, constant temperature and barometric pressure are not to be expected. If the temperature rises, an additional amount of

Digitized by Google

gasoline will evaporate and force some of the vapor and air out of the vent by a slight increase in pressure. If the temperature falls the contraction in volume of gases in the tank will draw in fresh air which in turn will be saturated with vapor. Therefore, fluctuating temperatures will result in a gradual loss of vapor from a partly filled tank. These losses will be somewhat proportional to the volume of vapor space in the tank. A tank nearly full will lose much less than one which is nearly empty.

Losses of this kind in a vented tank above ground may be largely due to large daily changes in temperature. For underground storage tanks these changes are probably negligible, except for the effect of filling with fresh supplies at different temperature. However, changes in barometric pressure have much the same effect. When the barometer rises fresh air is forced into the tank and when it falls some of the vapor-air mixture is forced out. Here again the loss is proportional to the vapor space, and a full tank suffers only slight losses. Such losses occur in both underground and exposed tanks.

Another source of loss of gasoline vapor is the operation of filling with a new supply. Assume a 1,000-gallon tank nearly empty. It will contain from 1 to 3 gallons of gasoline in the form of vapor depending on the temperature of the residue of gasoline. If this tank is filled with 1,000 gallons of fresh gasoline the vapor is forced out of the vent and lost. This loss, though small, appears to be a distinct and practically unavoidable loss of material. At each new filling of a tank, a small percentage (anything up to about 0.5 percent) of the previous tankfull is wasted.

Thermal Expansion Losses.—The changes in volume of gasoline with changes of temperature result in apparent losses and gains in the amounts of gasoline which can be taken out of tanks which contain presumably the same amount. These are not real losses of gasoline but changes in the amounts sold due to changes in the actual volume of the product as withdrawn from storage.

This comes about through the fact that gasoline as delivered to the underground tanks of the filling station comes in tank wagons which are often filled from above-ground tanks. The gasoline is at about the temperature of the outside air. This gasoline goes into an underground tank which keeps about the same temperature winter and summer. Consequently, the supply of gasoline which is measured as, say, 1,000 gallons, at a temperature anywhere from 0 to 100° F, shortly changes its temperature to that of the underground tank which may be from 50 to 60° F and practically constant throughout the year. Accordingly, a given amount of gasoline correctly measured as to volume, will change in volume with the change in temperature and the amount measured out of the tank will differ from that measured into it by some 1 percent for each 15° change in temperature.

There will be an apparent loss of gasoline in summer when the product is delivered to the service station warm and cooled in the storage tank, and an apparent gain in winter when the tank wagon deliveries are colder than the storage tank. On the year's business therefore the filling station should just about break even so far as thermal expansion and contraction of gasoline are concerned. To be sure, if a large preponderance of the business is done in summer, there will

Digitized by Google

be a small net loss in the gallonage marketed and vice versa if the winter season is the busy one.

Safety.—One may scarcely omit some consideration of safety in relation to the handling of gasoline. Considering the hazard presented by the use in large quantities of a product having such inherent sources of danger, it is surprising how few serious explosions or fires have resulted from the general marketing of gasoline. Unfortunately, the same cannot be said for its random use by individuals.

From a safety standpoint, volatility renders gasoline hazardous when exposed to the air in any inclosed or poorly ventilated space, as a mixture of vapor and air may be formed which is capable of violent explosion. The explosive energy which can be thus produced in, say, a small room of 1,000 cubic feet, exceeds that of 50 pounds of smokeless powder. On the other hand, the probability of producing a mixture of this sort is rather remote. Gasoline vapors mixed with air are explosive only over a rather narrow range. If less than about 0.5 percent, or more than about 6 percent of gasoline vapor by volume is present in the air, the mixture cannot be ignited.

Violent explosions will occur only for mixtures well within these limits. Thus if a gasoline tank contains considerable liquid which has been there for some time, or has been well agitated, the mixture of air and vapor above the liquid will be far too rich to explode. It will, of course, burn quietly if exposed to outside air and ignited. On the other hand, if a tank is nearly empty so that there are not enough light portions of the gasoline to saturate the air a violently explosive mixture may be formed.

The same may happen if fresh air has been admitted to a tank by rapidly withdrawing gasoline from the bottom. An explosive mixture also might occur in a tank at very low temperatures when the vapor pressure of the gasoline is much less than ordinary. There is in general only one means whereby dangerously explosive mixtures of gasoline vapor and air can be produced quickly, that is by the sudden spraying or spilling of considerable amounts of gasoline into the air. Explosions of such mixtures have occurred at times when a pool of gasoline has collected near the intake to a carburetor on a boat or motor car engine, and a back fire has suddenly distributed the liquid in a fine spray which could quickly evaporate and mix with the air. Such an explosion may readily wreck an entire building if enclosed.

In general, the handling of gasoline with entire safety requires knowledge of the volatility of the product and of the conditions under which the vapors can mix with air, as well as practical experience and eternal vigilance. Fortunately, it is only on rare occasions that the worst results occur, but for this very reason users of gasoline are liable to become careless, since dangerous practices may be repeated hundreds of times without accident.

General Considerations.—In the handling of gasoline at the present time, losses due to evaporation must be considered as normal. In underground storage, all losses due to evaporation should not exceed 1 percent and are usually not more than 0.5 percent of the total gallonage handled. With exposed storage tanks, the evaporation losses may range from 1 to 2 percent. In the case of the retail operator, there are volume losses in hot weather and volume gains in cold weather due to thermal expansion of the gasoline.

Digitized by Google

For any particular dealer, whether large or small, it should be practicable to arrive at a figure representing normal losses for his particular operations and equipment, by carefully kept records over a period of several weeks at various seasons of the year. If the losses so arrived at appear excessive, attention should be directed toward errors in measuring devices or toward possible leaks in storage tanks and accessory piping.

The safe handling of gasoline requires a knowledge of its behavior under various conditions where explosive vapors may be formed. Fortunately, the general technique of wholesale distribution and marketing to private users is a remarkably safe procedure. The miscellaneous handling of gasoline by unskilled persons is hazardous.

Mr. BEEBE. Mr. Chairman, will there be any of these papers available for distribution, particularly Dr. Dickinson's?

The CHAIRMAN. I think we have mimeographed copies of Dr. Dickinson's paper.

Mr. HOLBROOK. Dr. Dickinson, if there is a supply of your circular letter in relation to this subject available, will you have a number of them delivered here this afternoon?

Dr. DICKINSON. All right.

The CHAIRMAN. I want to thank you, Dr. Dickinson, and I think the delegates appreciate your address this morning. If it can be given to us in permanent form it will be very much worth while.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON MODIFICATION OF SEVERAL CODES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN

Presented by F. S. HOLBROOK, *Chairman*

Mr. Chairman and gentlemen, this report will cover items in a number of codes, in which your committee feels that some amendment or modification is necessary.

The nature of these recommendations is such that it seems we will get along more rapidly if we discuss, and adopt or reject, each proposed amendment as we reach it, rather than to postpone action until the report as a whole is before you.

I presume each of you has a copy of this report in your hands; if not, there is a supply available.

The first suggestion your committee offers is in relation to specification 2, under the heading "Liquid Capacity Measures." This specification now reads as follows:

> 2. Liquid measures of the customary system shall be of one of the following capacities only: 1 gallon, a multiple of the gallon, or a binary submultiple of the gallon, that is, a measure obtained by dividing the gallon by the number 2 or by a power of the number 2: Provided, however, That nothing in this specification shall be construed to prevent the use of cans for ice cream, exclusively, in the 2½-gallon (10-quart) size, but only when having an inside diameter of not less than 8½ inches, or of brick molds for ice cream, exclusively, in 5-pint and 3-pint sizes, or of bottles for milk or cream in the 3-pint size.

The recommendation of your committee is that the last clause of the specification reading:

> or of bottles for milk or cream in the 3-pint size

be stricken out.

Your committee believes that our normal system of permissible sizes of measures should be rigidly adhered to, and consequently the

Digitized by Google

committee has resolutely set its face against the introduction of such odd sizes as 5-, 6-, and 7-quart measures, one-third and two-third pound weights, and various other sizes, which we have been requested from time to time to recognize in the specifications. Such odd sizes when used for commercial weighing or measuring purposes would facilitate the perpetration of fraud and are likely to be the cause of mistakes, since a user may, by intention or otherwise, select the wrong size measure or weight, when many sizes differing only slightly from each other are available. Your committee feels that the 3-pint milk bottle is a departure from the usually recognized sizes in our measuring system. The 3-pint measure for other uses, is not recognized. To be consistent, we feel that the 3-pint milk bottle should be stricken from the code. It appears that no hardship will be caused thereby, because, although the 3-pint size has been recognized for a great many years, few or none of them have, according to our understanding, ever come into use.

Mr. RAGLAND. Mr. Chairman, I move we accept the recommendation of the committee.

(The motion was seconded.)

Mr. RICHARDS. This wouldn't affect the 3-pint milk bottles now on the market, of course?

The CHAIRMAN. In the various States in which this size is authorized by statute, they would have a right to continue, I understand.

Mr. RICHARDS. If they are now permitted without specific recognition in a State law, would they immediately be taken out?

The CHAIRMAN. Mr. Holbrook will answer that question.

Mr. HOLBROOK. Normally, we certainly should not condemn 3-pint milk bottles which have come into use during the life of this specification. It would, of course, be very difficult to identify milk bottles which are in use at the time this amendment takes effect, on account of the difficulty of marking milk bottles. However, in view of the fact that the specification has recognized this size for many years, I would be inclined to include in the recommendation of the committee that this specification be nonretroactive. The 3-pint milk bottles now in use—I think the number is very small—should be allowed to remain in use until normally retired, by breakage or otherwise. The life of a milk bottle is not a very long one, at best.

Mr. BAUCOM. Mr. Chairman, the question came up in my State some time back and we doubted whether the 3-pint was constitutional. We accordingly did not include this size in the regulation which we promulgated.

Some jurisdictions have recognized the third-quart milk bottle. I think this size ought to be gotten rid of; we ought to outlaw them. I am afraid as drawn here, that under this specification we won't get rid of them.

(The question was taken, and the motion was agreed to.) [10]

The CHAIRMAN. Gentlemen, we now have the distinct honor and pleasure of having with us the Honorable John Dickinson, Assistant Secretary of Commerce. I am very much pleased to introduce the Honorable John Dickinson.

[10] The consideration of this report was resumed at the seventh session. See pp. 99 and 103.

Digitized by Google

ADDRESS BY HON. JOHN DICKINSON, ASSISTANT SECRETARY OF COMMERCE

Ladies and gentlemen, I have no intention whatever of interrupting your proceedings here, but in the absence of Secretary Roper, who is now on the west coast, I wanted to come out here as the acting head of the Department of Commerce, and express my appreciation to you gentlemen for the cooperation with which you are working with our Department.

The Department of Commerce, of course, has numerous activities, activities in connection with fisheries, activities in connection with foreign trade, and in connection with shipping, but not the least among its activities are those conducted here at the National Bureau of Standards; and I want all those who have contact with the National Bureau of Standards, and who are working and cooperating with it, to realize that the Department as a whole, and the chief executive officers of the Department are very much interested in keeping in touch with the work of the National Bureau of Standards, and of giving what assistance we can, not merely to the National Bureau of Standards, but, as I said, to all of those who are working and cooperating with the National Bureau of Standards.

One more word, and that is as to the nature of this Conference in which you are engaged. It seems to me to be a very significant thing, and to hold out, in some respects, a suggestion for the solution of many of the difficulties, and they are difficulties, of our dual form of government. There should be a cooperation of this kind between the State officials and the officials of the departments of the Federal Government, which deal with the same subject matter.

The problems of the Federal Government and the State officials, as you realize, are conflicting. The main outlines, of course, are sketched in the Constitution, but the Constitution does not go into detail, and consequently in carrying out all of the details there are bound to be differences. We must find where the lines between the Federal Government and the State powers come. Those differences are not very likely to be raised if the Federal power and the State power work hand in hand and step by step in a cooperative manner. I am not one of those attempting to take something away from the other fellow. I know that is not what you are doing, and that you are working in the opposite direction from that.

The Constitution entrusted to the Federal Government the standards of weights and measures, but, on the other hand, it would be unwise and inconvenient for the Federal Government to undertake to build up on the basis of a doubtful constitutional grant of power, a mechanism of its own.

It is highly proper that the details of weights and measures should not be in the hands of the Federal Government, but in the hands of local people, without, of course, involving the national uniformity of activities. So, this National Bureau of Standards and the State officials both have to do with weights and measures; we have a model system on this subject, and the Federal Government and the State officials are cooperating in the matter. It might very well be extended to other fields.

The manifold lines of policy are laid down by Congress, but Congress has failed to give us the details of weights and measures. The

Digitized by Google

application of those standards are all administrative, and all of the details, and the making of regulations are matters in the control of States in which you are cooperating with the Federal Government. It is you upon whom the burden of the work falls, of course, as State officials. So that is the situation regarding this subject and you are acting in harmony with the Federal Government in giving effect to these matters.

I want to express my appreciation of your leading. You are giving your services to the Federal Government, and the Federal Government is putting their services at your disposal. This may well be a very happy goal in other fields and in this particular field it is absolutely essential.

I am very glad indeed to have had the opportunity to be here and to be able to tell you of this branch of the Federal Government, and that it depends, of course, on your cooperation.

I thank you.

The CHAIRMAN. Thank you, Mr. Secretary.

WEIGHTS AND MEASURES AND PETROLEUM PRODUCTS

By D. V. STROOP, *Secretary, Division of Marketing, American Petroleum Institute*

Mr. Chairman, members, and guests of the conference, oil companies, by their advertising, have made costly investments in good will of the motoring public toward their products. They cannot and will not jeopardize their investments in goodwill by permitting these customers to receive short weight or short measure in their purchases. The problem of preventing such short weights and short measures is of mutual concern to you, the sealers of weights and measures, to us, the marketers of petroleum products, and to the manufacturers of measuring devices. You are in duty bound to protect the public against fraud while we are employed to give our customers what they purchase. The equipment manufacturers provide the means whereby our aims may be accomplished. There can be no differences in opinion between us as to the principle that purchasers of petroleum products must receive in full the quantity of products purchased. But in the past, and possibly in the future, there have been and may be differences of opinion as to how the principle may best be applied and the result accomplished. We could not presume to tell you anything regarding your problems or the methods you apply to their solution; however, we welcome this opportunity to give you some idea as to our problems in connection with the delivery of full measure in the sale of petroleum products.

There are some thirty-odd integrated oil companies whose products are sold at more than 200,000 retail outlets. All of these companies, which make substantial investments to gain the good will of the public, own retail outlets, but these total probably less than 14 percent of the total number of stations at which their gasoline is sold today.

Based upon the recent report of the special subcommittee of the House of Representatives Committee on Interstate and Foreign Commerce, it may be estimated in round numbers that approximately 15,000,000,000 gallons of gasoline will be sold this year to more than 25,000,000 consumers. This amounts to an average of about 600 gallons per customer.

Digitized by Google

For the sake of definiteness we may say that these consumers will purchase the bulk of this gasoline at some 250,000 retail stations. On this basis each station has an average potential market for 60,000 gallons of gasoline per year, or 5,000 gallons per month, or about 165 gallons per day.

It may be estimated that at least 750,000 gasoline dispensing pumps are used in the delivery of this gasoline. If this figure is used, the average pump delivers only about 55 gallons per day, which explains why a motorist seldom experiences delay in making a purchase of gasoline for his car. From this you may realize the tremendous problem the industry has to bear in the maintenance of gasoline dispensing pumps, and because of the relatively small quantity delivered per pump you can realize the desire of industry to minimize expenditures on such equipment. This factor influences the industry to favor a pump which will require a minimum amount of maintenance, repair, and reconstruction. Mechanisms must be simple, rugged, and dependable.

The equipment will be operated by all types and classes of people, who, in the main, will be none too careful in the way it is used. Some of it may be operated by persons who will be tempted to use it dishonestly. This temptation undoubtedly can be fostered by high taxes on gasoline where a seller may greatly increase his profit by short-measuring his customers. In fact, the imposition of disproportionately high taxes on gasoline creates an unhealthy moral temptation for personal gain though either tax evasion or short delivery.

Such a situation is fraught with much danger of loss of public good will toward the oil companies which advertise the economy of their products. A short delivery means reduced mileage per gallon and the consumer is more likely to blame the mileage reduction on the quality of the fuel rather than upon a deficiency in the quantity purchased. He depends upon you, his sealers of weights and measures, to protect him against short measure. You, in turn, may be tempted to ask us for a fool- and fraud-proof pump. We, in turn, cannot justify the expenditures necessary to provide such equipment, even if such is available.

Consider for a moment the sale of lubricants. On an average a retail station may sell about 3 gallons of lubricating oil per day. Certainly such small-volume business can justify only a minimum of expenditure for the prevention of short-measure delivery.

It isn't the cost of the product which demands conservation in such expenditures, it is the cost of complicated measuring equipment, its maintenance, its repair, and its replacement, which dictates the apparent reluctance of oil companies to meet some change in specifications and tolerances on measuring dimensions. Dispensing equipment for petroleum products rarely has an opportunity to wear out. Obsolescence in one or more of many forms usually relegates the equipment to the scrap heap. Changing weights and measures requirements has been a most effective factor in obsolescence, even of equipment still capable of delivering full honest measure.

A third product sold to consumers is automotive gear lubricant. The sale of this at the average retail station probably does not exceed 3 pints per day. Here again the limited volume of sales calls for strict economy in expenditures for dispensing equipment. The situ-

Digitized by Google

ation is complicated by recent developments in the construction of automotive equipment because of the necessity for dispensing a number of different grades and classes of lubicant. Some stations have found it necessary to supply as many as five different grades of lubricant. You can realize the industry's reluctance to purchase a relatively expensive metering device which, on the average, will be called upon to measure less than a pint of a product per day.

Even this does not tell the whole story, because the sale of gear lubricant and, to a lesser extent, the sale of lubricating oil, includes a servicing factor. A greasing pit or lift must be provided. The gear housing or crankcase may require cleaning, flushing, and refilling. Frequently the expense of servicing may exceed the price received for the products.

When we patronize a meat market to purchase a roast, we expect to pay for the services of the butcher, in addition to the meat we buy. Possibly our roast will include a considerable weight of bone. Both the meat and the bone will be delivered to us or, upon our request, the butcher will remove the bone and bind up the roast. Usually if the bone is removed it will be left in the market, even though it has been paid for in purchasing the meat.

When a customer purchases a pint or a quart of lubricant he requests delivery either in a portable container or in a housing or crankcase of his car. The delivery of the lubricant into the proper part of the car involves additional service. This service element is variable and cannot readily be evaluated, it must be averaged. The quantity of product delivered is measurable and should be measured, but the tolerances on such measurements, in all fairness, should be of a nature which will permit the use of simple and inexpensive equipment. Surely it seems difficult to justify a requirement for a narrow tolerance and relatively elaborate mechanisms for the measurement of a material, the price of which represents a considerable charge for service.

This brief paper gives a sketchy picture of some phases of our marketing problems which are closely related to your work. We are all endeavoring to accomplish the same result—a square deal to the public and satisfied customers. By working together we should be able to accomplish the desired result more quickly and easily than if we work independently.

You have assigned the work of drafting adequate and reasonable specifications and tolerances for measuring devices to your committee on specifications and tolerances. We assume, by reason of the geographic distribution of the members of this committee, that frequent meetings are impracticable. Probably this necessitates the transaction of a greater part of the committee's work at a meeting held just prior to a National Conference. Naturally this produces a feeling of uncertainty in the minds of the members of the institute's committee on marketing equipment, who may be vitally affected by some modification in specifications or tolerances about to be recommended by your committee.

The institute's committee also consists of members having headquarters in various parts of the United States. Its meetings are infrequent, and it is difficult to obtain immediate action on matters relating to specifications and tolerances for measuring devices.

Digitized by Google

The situation, however, is not unique in the work of the institute, as we now work cooperatively with a considerable number of organizations which are concerned with some phase of the industry's activities. In some cases the institute is represented in the membership of a committee of another organization. In other cases, joint committees are organized, and where neither of these cooperative measures appear to be practicable, we maintain a small group of specialists which is invited to meet with the committee of another organization.

It is my sincere hope that some mutually satisfactory arrangement may be reached, whereby these two committees can cooperate effectively in the establishment of specifications and tolerances on the measuring devices used in the sale of petroleum products.

The CHARIMAN. Thank you, Mr. Stroop.

SEALED CANS FOR DISPENSING LUBRICATING OIL

By MARTIN L. LANG, *Commissioner of Weights and Measures, State of Indiana*

Manufacturers, distributors, and merchants are constantly searching for new ideas and new marketing methods for their products. Oil marketers have kept pace with the times in this constant search for new ideas and their latest contribution, in this respect, is oil in hermetically sealed cans. Motor oil in sealed cans is certainly not a new idea, as its history can be traced as far back as 1920.

At that time the quart can was intended only as a reserve supply of motor oil that the motorist could carry with him on long journeys through the country. Automobiles were not developed to the high state of perfection in which we find them today; therefore they required more oil, and, as there were long stretches through the country where no service-station facilities were available, the motorist had to carry a reserve supply with him. Also, many motorists who were particular about the brand and grade of oil used in their motor took this means to protect their motor from an inferior grade of oil.

The canned oil of this period filled the breach in splendid shape, but the increase in the number of highway service stations and the extension of oil companies over large sections of the country lessened the necessity, at that time, for oil in sealed cans. The early promoters of the canned-oil industry recognized the need, but at that time made little progress, probably due to two causes, the comparatively high cost of cans, and no well-developed opener or dispenser.

It is obvious now that this method was bound to fail because of the length of time required to drain a can through the small openings punctured in the top and the inability to get to the fill pipe of the engine without some additional equipment such as a funnel. The sealed cans, at that time, did not prove successful and, although the idea was good, it was temporarily abandoned.

During the dormant period of the sale of canned oil the refineries recognized the good qualities of this method of oil distribution, namely, dirt proof, tamper proof, and the guarantee to the customer receiving full measure of the proper grade of oil; with the result that in 1932 canned oil was reintroduced along with practicable dispensers for draining the oil completely from the can to the fill-pipe of the motor.

It is well to remember that the growth of this new enterprise, the sale of packaged oil, is only in keeping with the growth of all packaged

Digitized by Google

goods, such as vegetables, sugar, crackers, dried fruit, etc. The reasons justifying the housewife's preference for packaged food justifies the motorist's preference for canned oil with the additional protection against substitution. The substitution of inferior food would be noticed by the housewife before it reached the table, but the substitution of used or inferior oil might seriously damage a motor before being detected.

The three questions most often raised in discussing, pro and con, the sale of canned oil are, first, the possibility of the used cans being refilled by the oil bootlegger; second, the accuracy of the statement as to grade and SAE (Society of Automotive Engineers) viscosity, as lithographed and embossed on the can; and, third, the correctness of the measure.

In discussing the first question raised—that of the possibility of refilling the used cans—I can best explain this by giving you an explanation of the construction of the cans used. The cans used for this purpose are double seamed, bottom, side, and top. At the extreme top and bottom of the seam found on the side of the can is a notch, or that part of the side wall of the can used when the top and bottom are hermetically sealed on. On close examination of the can you will observe the notch is the end of the double seam which is flattened to a single thickness to permit a perfect union of the side wall to the top and bottom. If the bootlegger cuts off the destroyed cap, the first obstacle he encounters after refilling the can, is to seal the cap over the double seam. This cannot be done successfully due to the thickness of the double seam; leakage would result where the cap and double seam came in contact with each other. In case this oil were to be shipped a leakage would be detected by the person receiving the shipment and he would in turn eye the shipper with suspicion. In addition, the used can would be much shorter, due to the second capping operation, and this would be quite noticeable to the public and to the weights and measures inspector. In resealing these cans the bootlegger would have to obtain a supply of caps or lids on which it would be necessary to have the SAE number embossed. It would be unethical for any can manufacturer to sell or furnish embossed caps or lids without the cans accompanying them and then only to reliable oil refineries, and this practice, I have been reliably informed, is observed by the can manufacturers today.

About the only person who could hope to have any success in the refilling of the cans would be the service-station operator who attempted to augment his supply of correctly canned oil. However, in his case, in addition to the previous handicaps mentioned, the augmenting of his supply would immediately arouse the suspicion of his local distributor who would investigate the decreased sale of his product.

The second question under discussion is whether or not the can contains the oil of a grade and viscosity lithographed and embossed on the can. Every possible precaution is taken by the can manufacturer and the refinery to assure the correct brand, grade, and viscosity of oil asked for by the motorist. The cans are manufactured of a standard size, lithographed, and packed in cases for shipment. The tops or lids of the cans are embossed with the SAE number and this number is also placed on the side of each case of empties. At the refinery the empties are placed on a loading belt which carries

Digitized by Google

them to the filling machine, where they are filled automatically. As the cans pass from the filling machine to the automatic capper, the empty cases are being conveyed to the packing machine and by the time the filled cans reach the packer, the empty cases are on hand and ready to be packed and the cases sealed.

Millions of dollars are being spent annually by the oil companies in their laboratory tests to determine the correct viscosity of oil for use in summer and winter in all makes of motors, therefore, it is presumptious for us to believe that our reputable oil refineries would condescend to improperly fill the cans with an inferior grade or a different viscosity than is lithographed and embossed on the can.

The third question—that of correct measure—is one which is always uppermost in the minds of the public and we, as weights and measures officials, are interested in this question raised in connection with sealed oil. It is my opinion that the purchaser of canned oil is as certain of receiving correct measure as he would be by any other recognized method. The cans are manufactured in two standard sizes, namely, the 1 quart, which is used to replenish the supply of oil in the crank case, and the 5 quart, which is used for oil changes. The can manufacturers recognized the fact that oil hermetically sealed would expand at a high temperature; therefore the cans were constructed to contain slightly more than the size stated on the can. They were also aware that weights and measures laws require the delivery of full measure; therefore ample overage was allowed in the construction of the can to take care of "clingage" or the oil adhering to the can after reasonable time has been given for delivery.

The cans are filled at the refinery by automatic-filling machines and these machines are adjusted for packaging oil of different grades and SAE viscosity, to assure full measure. This change is necessary due to the fact that heavier oils have a greater "clingage" than lighter oils. The oil refinery must determine by laboratory tests the amount of clingage for each grade of his respective oil, in each SAE number marketed, and determines by weight the amount of oil sealed in each can in order to dispense full measure, either 1 full quart or 5 full quarts. To further assure the customer receiving full measure filled cans are occasionally taken from the line and reweighed.

It appears to me that the method adopted by the refineries to determine the amount of oil sealed in each can surpasses the method now employed by the service station attendant in measuring in the field, who must rely solely on measurement. The attendant is unable to measure his oil throughout the year at the same degree of temperature, and we all realize a change in temperature will affect, in a small degree, the amount of oil placed in a measure or measured into a container.

I have in the foregoing discussion answered the three questions most likely to be raised relative to canned oil, which are, the possibility of the used cans being refilled by the oil bootlegger; the accuracy of the statement as to the grade and SAE viscosity as lithographed and embossed on the can; and the correctness of the measure. In doing this, I have traced this method of dispensing oil from the manufacture of the cans until it is ready to be dispensed by the service-station attendant.

Digitized by Google

We are living today in an era, doubtlessly the most chaotic and bewildering in our entire history. Bootlegging, substitution, tax evasion, and price cutting are rampant on every hand. The reputable and legitimate companies are faced with the unscrupulous practices of a small minority. Because of these practices of a small minority, public suspicion is often directed at an industry as a whole. The retail oil business has come in for its share of adverse criticism, due mostly to conditions over which it has no control and to the unscrupulous practices of a small minority of retail oil merchants.

Formerly, the honest service-station operator, who made a large outlay of capital in barrels of oil of different SAE viscosities, highboys for each oil, etc., had no protection from the operator who sold practically all brands and viscosities out of the same barrel. The unscrupulous operator might without detection dilute a premium oil of a good brand with a competitive oil, and in some instances has been known to dilute premium oil with used oil. Today, with the advent of packaged oil, canned in hermetically sealed cans, the situation has changed. The motorist can take the can of oil in his hands and, without danger of spilling oil on his clothing, read the brand and grade lithographed on the side of the can and the SAE number embossed on the top; he is in a position to assure himself that he is receiving the brand, grade, and viscosity asked for.

Another argument can be used for canned oil, but this is one which does not so materially concern the weights and measures inspector, and that is, freedom from contamination. The sealed can prevents contamination and preserves the original purity of the oil as refined; therefore, the motorist is sure of receiving oil free from dirt, grit, and water.

The sale of the earliest canned oil was handicapped by not having a well-developed dispenser. When sealed oil was first introduced the cans were marked on the top in two places for opening, and this was done at that time with a screw driver or punch; this method of opening the can proved unsuccessful because the small opening made the drainage a slow process. Another drawback was the inability of the motorist to reach the fill pipe of the motor without a funnel.

Much of the success attained by the canned oil of the last few years is attributed to the convenient dispenser. The dispensers in use today are not measures and they have embossed on them the words, "Not to be used as a measure." These dispensers are constructed to open the can in such a way as to destroy the can for future use and to permit rapid and complete drainage. The dispensers have therefore helped to make possible the rapid progress made by the oil industries in the sale of canned oil.

The dispensing of oil in hermetically sealed cans has met the general approval of the service-station attendant and the buying public as well. The interests of both, as well as the interests of the refinery, are guarded to the greatest possible extent. Therefore, it is my opinion that this Conference of weights and measures officials should at this time approve of the sale of oil in cans and adopt whatever specifications, regulations, or tolerances relative to both cans and dispensers as may be deemed necessary to safeguard the buying public in respect to correct measure, correct grade, and correct viscosity of the oil bargained for and paid for.

Digitized by Google

A few words in closing. We are trying to step forward, not backward. The matters presented in this paper are for the committee on specifications and tolerances to look into. I want to thank those who furnished the dispensing cans and this fine display of various types of openers.

Again I want to express my feelings for the fine cooperation given me in the past 2½ years by the National Bureau of Standards.

The CHAIRMAN. Thank you, Mr. Lang.

DISCUSSION OF ABOVE PAPER

Mr. CROCKETT. Mr. Lang, you spoke about the leakage that would occur in the shipping of oil in cans that had been refilled. What percentage of leakage would you expect, if the cans had been tampered with?

Mr. LANG. This paper was prepared after a survey made in the State of Indiana, and possibly over 12 other States, Nebraska, Iowa, Kansas, Missouri, and some of the Eastern States. We think there is a very small percentage of tampering.

Mr. CROCKETT. The main trouble that you have is not with the refinery?

Mr. LANG. We are not troubled by the refinery.

Mr. CROCKETT. Would you say there might be trouble with the station operator? Could not the station operator refill a can?

Mr. LANG. It has been done.

Mr. CROCKETT. I will show you a few samples of refilled cans, the operation being performed with a tool that only costs 20 cents. Here are some cans which I refilled myself. The first one I refilled took me about 35 minutes. I could do it now in 45 seconds. (Exhibits cans.) We try to make them destroy the cans. You just can't do it. It is very easy for anyone around a service station to refill the empty cans with crankcase oil and make a 25-cent profit on it. I have shown some of these refilled cans to various people and the only ones who could find that they had been tampered with were the mechanics in the shops. How many motorists take one of these cans in the hand to look at it? How many weights and measures men do?

Now these cans, with the exception of one, have all been soldered. Here you see one with just a slight spot of oil on the outside. That is not soldered. I will show you how it is done. (Demonstrates taking top off can with knife.) There you are. If the can had been soldered I could still do it in less than a minute. To do away with this you should make them destroy the lid or side of the can as it is opened.

Mr. RICHARDS. It seems strange to us, as glass manufacturers, Mr. Lang, that in the paper you prepared no mention was made of the glass container for dispensing lubricating oil.

Mr. LANG. I am not condemning glass. Lubricating-oil bottles have been approved. This subject was sealed cans; hence I stuck to the subject.

Mr. VANDERSLICE. There are on exhibit in connection with this paper, various types of openers. In Philadelphia, I don't think we have accepted any opener, except one that rips the can up the side.

Mr. R. E. MEEK. I wish to call attention to the fact that Mr. Lang referred those questions to the Committee on Specifications and Tolerances. These questions can be answered correctly only after

Digitized by Google

careful study. They should be handled by that committee. We could go on for days discussing this matter.

Mr. LANG. This is a hot subject. I knew that before I left Indiana. I feel that it should be left to the Committee on Specifications and Tolerances.

Mr. JAKOB (representing the Continental Can Co.). Mr. Chairman, what this gentleman showed here was something I saw about a year ago. There was some mechanic that worked out of Baltimore who had some spare time, so he made six samples and sent them to us. There are probably all kinds of ideas as to things that can be done, but, after all, it isn't really a fact that they actually happen in practice.

We have heard rumors from time to time about substitutions. We have spent thousands of dollars trying to trace them down. There is only one case I know of that actually happened. That was in Dayton, Ohio, and that man was caught. He wasn't caught by anybody that saw him make the refill. The only way he was discovered was by the fact that the oil company from their records discovered that whereas he had formerly bought 300 cases a month, he was eventually only buying 30. I really think that this idea of refilling a can is just a bugaboo that hasn't materialized, except in this one case.

We have tried our best, doing so to help the refinery and to protect our own business. All service stations are being watched as to amounts purchased and sold.

The CHAIRMAN. Gentlemen, I think, perhaps we have discussed this long enough. We haven't much time, and the particular aspect under discussion is not a weights and measures problem.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON MODIFICATION OF CODE FOR VEHICLE TANKS, PRESENTED BY F. S. HOLBROOK, CHAIRMAN

Mr. Chairman and gentlemen, your Committee on Specifications and Tolerances has prepared its report on modifications deemed advisable in the code of specifications and tolerances for vehicle tanks. This has been available for some time and doubtless each of you has a copy at hand.

One of the principal changes recommended in this code consists in recognizing for the first time vehicle tanks equipped with meters. As you will remember, the code at present in effect deals only with vehicle tanks when used as measures. Consequently, the definition has been changed to some extent, and the code has been split into three parts. The first part consists of general specifications, which are equally applicable both to vehicle tanks used as measures, and to tanks equipped with meters; the second part contains those specifications which are applicable only to tanks which are used as measures; and the third part refers solely to tanks on which meters are mounted.

NOTES.—"General Specifications" shall apply to vehicle tanks either used as measures or equipped with meters. "Specifications for Vehicle Tanks Used as Measures" shall apply to vehicle tanks when the tanks or the compartments thereof are used or to be used as measures to determine the amount of liquid delivered. "Specifications for Vehicle Tanks Equipped with Meters" shall apply to vehicle tanks on which meters are installed to determine the amount of liquid delivered.

In determining the capacity of a vehicle-tank compartment, water is recommended as the testing medium. In testing the accuracy of a vehicle-tank meter,

Digitized by Google

the testing medium should be liquid of the same character, or of approximately the same viscosity, as that of the liquid to be commercially measured. Whenever the testing medium is a petroleum product, due care should be exercised to reduce to a minimum, inaccuracies caused by evaporation or by volume change resulting from change of temperature of the liquid.

In reading the above I have added the additional words "or of approximately the same viscosity" after the word "character" in the clause "should be liquid of the same character as that of the liquid to be commercially measured". These added words are not on the copies in your hands.

The committee recommends the words which I have orally inserted to make it unnecessary for the weights and measures official to use hazardous testing means in his calibration of the tanks. We all know that liquids are available which will behave in a manner similar to gasoline, for instance, but which are not equally inflammable and explosive.

DEFINITION

A vehicle tank is an assembly used for the delivery of liquids, comprising a tank, which may or may not be subdivided into two or more compartments, mounted upon a wagon, automobile truck, or trailer, together with its accessory piping, valves, meters, etc. The term "compartment" shall be construed to mean the entire tank whenever this is not subdivided; otherwise it shall mean any one of those subdivided portions of the tank which is designed to hold liquid.

GENERAL SPECIFICATIONS

1. Permanence.—A vehicle tank shall be so designed and shall be of sufficiently substantial construction that it may reasonably be expected to withstand ordinary usage without impairment of the accuracy of the deliveries made therefrom; the shell and the bulkheads shall be of such construction that they will not become distorted under any condition of liquid lading.

2. Venting Means.—Each compartment shall be provided with suitable venting means to prevent the formation of air pockets by permitting the escape of air from all parts of the compartment designed to be filled with liquid and to permit the influx of air to the compartment during the process of delivery.

3. Marking.—All lettering and figures required under these specifications shall be of such size, design, material, and location, and shall be so applied or affixed, that they will not tend easily to become obliterated or illegible.

4. Fraudulent Construction.—All vehicle tanks and all devices designed to be attached thereto and used in connection therewith shall be of such design and construction that they do not facilitate the perpetration of fraud.

SPECIFICATIONS FOR VEHICLE TANKS USED AS MEASURES

5. Indicators.—*An indicator shall be provided within the fill opening of each compartment, which shall be located approximately midway between the ends of the compartment. The indicator shall be so designed that it will clearly, distinctly, and unmistakably define the height to which the compartment must be filled in order to contain its marked capacity. If this indicator is adjustable it shall be so constructed that it can be sealed in such a manner that its position cannot be changed without destroying or mutilating the seal.*

6. Expansion Space.—*The indicaior shall be so positioned that when a compartment is filled to the indicator there will remain an expansion space of not less than 0.75 percent of the nominal capacity of the compartment.*

7. Provision for Complete Delivery.—The tank and the delivery piping shall be so designed and constructed and shall be so mounted upon the vehicle that when this is standing upon a level surface complete delivery may be made from any compartment through the delivery faucets or valves whether other compartments are full or empty.

8. Diversion from Manifold.—When two or more compartments discharge through a manifold, effective and automatic means shall be provided to prevent the passage of liquid from the manifold into the discharge line from any compartment.

Digitized by Google

In relation to the specification last read, it may be said that it has been found that if the lines to the manifold from one or more empty compartments are open when discharging from one compartment, the liquid will back up into such compartments and level off in these compartments. That furnishes an opportunity for fraud because after the above operation has taken place it would be possible for the man delivering the load, to close the manually-operated valves in the lines from these compartments in which the liquid has leveled off and thus trap the liquid which has entered these compartments.

9. Piping.—When emergency valves designed to close the discharge outlets from compartments are provided, the capacities of such compartments shall be construed as including the capacity of the piping leading therefrom, and such emergency valves shall always be open when compartments are being filled or their capacities are being checked.

10. Marking of Capacity.—Each compartment of a tank shall be plainly and conspicuously marked with a designating letter or figure and each delivery faucet or valve shall be correspondingly marked to indicate the compartment of which it is the outlet. In addition, the tank shall be plainly and conspicuously marked to show the capacity, to the nearest half gallon, of each compartment *and such marking shall indicate that the capacities given are measured to the indicators provided. This latter marking shall be placed adjacent to the faucets or valves.*

SPECIFICATIONS FOR VEHICLE TANKS EQUIPPED WITH METERS

11. Meter Requirements.—Meters installed on vehicle tanks shall conform to all applicable requirements of the specifications for liquid-measuring devices of the wholesale type, except insofar as these may be modified by the following requirements.

12. Return of Indicating Element to Zero.—*Meters installed on vehicle tanks shall be so designed and constructed that the indicating element used to tally sales and deliveries to individual purchasers or to indicate the amount delivered when any portion of the cycle or stroke has been completed shall be returnable readily to a definite and clear zero indication before the next delivery is begun. Means shall be provided to prevent the indicating element from being returned beyond the zero graduation. The indicating element may be advanced only by the mechanical operation of the device itself: Provided, however, That the device may be cleared by advancing the indicating element, but in this event the indication shall be obscured and remain obscured, until the zero is reached.*

13. Location of Meter.—The meter shall be so positioned that the indications may be easily and accurately read.

14. Discharge Lines.—If the unit be designed for discharge by gravity, the discharge line shall be as short as practicable and there shall be no shut-off valve at its discharge end. If the unit be designed for discharge by means of a pump, the discharge line shall be of the wet-hose type with a shut-off valve at its discharge end, and immediately adjacent to this discharge valve there shall be installed a spring-loaded check valve so adjusted that drainage of the discharge line will automatically be prevented.

15. Diversion of Measured Liquid.—No means shall be provided by which any measured liquid can be diverted from the measuring chamber of the meter or the discharge line therefrom.

16. Air Elimination.—Adequate provision shall be made for preventing the passage of air through the meter. In a gravity-discharge unit, if a mechanical air eliminator or other means, to prevent inaccuracies of measure due to air or vapor in the liquid, be not provided, provision shall be made for preventing a vortex at the point of discharge from the compartment whereby air might be drawn into the line leading to the meter, and the meter shall be so mounted and the piping so arranged that the meter will not be drained of liquid during normal operation and that air will not be trapped in the meter inlet line when a compartment is filled. In a pump-discharge unit, a mechanical air eliminator or other means shall be provided adjacent to the meter inlet. This air eliminator or other means shall be considered effective if the provisions of specification 17 are complied with.

17. Constancy of Delivery.—The amounts delivered shall not vary from the standard by more than the tolerances hereinafter provided, (1) during continuous or intermittent discharge of liquid; (2) at all speeds of pump operation; and (3)

Digitized by Google

when the meter is operated at the maximum rate permitted by the installation, when operated at the rate represented or believed to be normal for the installation, and when operated at a rate approximately one-half the normal rate, or at a rate of approximately 20 gallons per minute, whichever is less.

NOTE.—Meters installed on vehicle tanks should be tested at each of the three discharge rates specified. The minimum testing draft shall be 50 gallons.

TOLERANCES

Vehicle Tanks Used as Measures.—The tolerances to be allowed in excess or deficiency on all vehicle tank compartments which are being tested by the weights and measures official for the first time, to verify the accuracy of a capacity marked by a manufacturer or user, shall be the values shown in the column headed "On first test" in the following table. The tolerances to be allowed in excess or deficiency on all subsequent tests made by the official, to verify the accuracy of a marked capacity, shall be the values shown in the column headed "On subsequent test." These tolerances are to be applied to the difference between the actual result of the calibration and the marked capacity of the compartment. Whenever the result of a calibration indicates that the marked capacity of a compartment is not correct within the tolerance to be applied, if the capacity of the compartment is adjustable, then the marking shall be changed in accordance with the provisions of specification 10, or the result of the calibration shall be taken as the basis of an adjustment and the adjustment shall be so made that the capacity of the compartment agrees as nearly as may be with such marked capacity; if the capacity of the compartment cannot be adjusted to agree with the marked capacity, then the marking shall be changed in accordance with the provisions of specification 10.

Capacity of compartment		Tolerances	
From—	Up to and including—	On first test	On subsequent test
Gallons	*Gallons*	*Gallons*	*Gallons*
-----	175	½	½
175	325	½	1
325	475	¾	1½
475	575	1	2
575	725	1¼	2½
725	875	1½	3
875	975	1¾	3½
975	1, 125	2	4
1, 125	1, 325	2½	5
1, 325	1, 500	3	6

Vehicle Tanks Equipped with Meters.—The tolerances to be allowed in excess or deficiency on meters installed on vehicle tanks shall be the same as those specified for liquid-measuring devices of the wholesale type, that is, 1 cubic inch per indicated gallon of delivery with a minimum tolerance of 50 cubic inches, for meters in use, and one-half of these values for new or reconditioned meters.

REGULATIONS

1. If a vehicle tank be damaged, repaired, or modified in any way which might affect the accuracy of measurement of its deliveries, it shall not again be used for measurement until inspected and, if deemed necessary, tested, by the weights and measures official.

(Signed) F. S. HOLBROOK, *Chairman*,
JOSEPH G. ROGERS,
JOHN P. MCBRIDE,
GEO. F. AUSTIN, Jr.,
Committee on Specifications and Tolerances.

Digitized by Google

DISCUSSION OF ABOVE REPORT

The CHAIRMAN. The matter is now open for discussion. We will consider specification 1.

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK. I would like to say that specifications 2, 3, 4, 5, 6, and 7 are unchanged in text. Specifications 2, 3, and 4 have been made generally applicable to all vehicle tanks within the purview of this code, while 5, 6, and 7 are suggested for application only to vehicle tanks used as measures.

Mr. GRIFFITH. I move you, Mr. Chairman, that all of the specifications which Mr. Holbrook has mentioned, be adopted as submitted.

(The motion was seconded.)

Mr. BAUCOM. Mr. Chairman, in reference to specification 6, I understand that the railroads have for years recommended and required 2-percent expansion space in their railroad tank cars. Of course the figure given here is less than that amount. We find that 25 States have adopted the railroad figure. We find that three-quarters of 1 percent is not sufficient expansion space, and have changed it in my State so as to allow a sufficient amount for safety. I was just wondering whether we should increase the figure suggested here. It wouldn't cause any difficulty to any vehicle tank in use. I have made all put in indicators so positioned as to provide for expansion.

Mr. STROOP. On the question raised by Mr. Baucom, it is true that railroads under the Interstate Commerce Commission regulations require a 2-percent expansion. However, the Interstate Commerce Commission in their truck regulations require an expansion space of only three-quarters of 1 percent.

Mr. BAUCOM. I am satisfied.

Mr. BUNDENTHAL. Mr. Chairman, I notice that specifications 5 and 6 are recommended to be nonretroactive.

Mr. HOLBROOK. They are nonretroactive in the present code.

Mr. BUNDENTHAL. I can see no reason why specifications 5 and 6 should be nonretroactive now. I would like to ask Mr. Holbrook's reason therefor. They may have a good reason for doing that.

Mr. GRIFFITH. The reason it is done is that it so appeared in the former issue of the specifications. However, specifications 5 and 6 are such that they have already been complied with by vehicle-tank manufacturers. I am confident that in the majority of jurisdictions tanks generally comply with these two specifications.

Mr. BUNDENTHAL. I move to amend the motion to make these two sections retroactive.

Mr. HOLBROOK. I think there would be no objection on the part of the committee. This code has now been in effect since 1925. Doubtless vehicle tanks now in use comply with these requirements.

The CHAIRMAN. The motion now is that specifications 2, 3, 4, and 7 be adopted as recommended by the committee, and that specifications 5 and 6 be adopted as recommended, except that they be made retroactive.

(The question was taken, and the motion was agreed to.)

Mr. GRIFFITH. Mr. Chairman, I move you the adoption of specification 8 as recommended by the committee.

Digitized by Google

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. GRIFFITH. I am going to move you, Mr. Chairman, that specification 9 be amended to the effect that the capacity of the compartments shall not include the piping outlets. The reason for that is the experience recorded in our office extending over a long period of time.

In actual practice in checking vehicle tanks on the street, we found that while the pipes were filled at the loading rack, before the control valves were closed, enroute between the loading rack and the delivery point, the pipes would be emptied. There would be no indication, as to how it happened, but we arrived at the conclusion that it had happened, since when the control valves at the bottom of the compartment were opened the liquid flowed into the outlet pipes at the time of delivery, and the delivery was short measure. We consider that these pipe outlets are not part of the capacity of the tank vehicle, and should not be included in the calibration. I therefore move you that section 9 be changed so as to eliminate the pipe outlets from the calibration and that only the capacity of the compartment be included.

Mr. RAGLAND. I will second that motion. You say that it is in our present code, but the words "emergency valves" are used; these pertain to fire hazard. The words should be "control valves."

Mr. DAVIS. Before this motion is considered I want to say I oppose the amendment offered by the gentleman from Baltimore, and hope it will not prevail for this reason: In Vermont we are continually having trouble with tank wagons that are being sent in, principally from Massachusetts, that have been calibrated in Massachusetts with the valves closed. We have been working under this specification as it now stands in the code. When our man goes around to calibrate the compartments, he opens the valves and calibrates them in that manner.

(At this point, at 1:02 p. m., the Conference took a recess until 2 p. m.)

Digitized by Google

SIXTH SESSION—AFTERNOON OF THURSDAY, JUNE 6, 1935

(The Conference reassembled at 2:14 p. m., at the National Bureau of Standards, Mr. John P. McBride, presiding officer, in the chair.)

DISCUSSION OF REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON MODIFICATION OF CODE FOR VEHICLE TANKS—Continued

The CHAIRMAN. Gentlemen, we are on specification 9 for vehicle tanks.

Mr. WHITE. I make a motion that specification 9 be amended to read as follows:

Vehicle tanks shall be equipped with control valves designed to close discharge outlets from compartments provided, and the capacities of such compartments shall not be construed to include the capacities of the piping leading therefrom, and such control valves shall always be closed when compartments are being filled, or their capacities are being checked.

(The motion was seconded.)

Mr. O'KEEFE. Mr. Chairman, the piping is part of the tank, and should be included in the capacity of the tank.

Mr. RAGLAND. Our practice in the city of Richmond for 3 years has been in accordance with the amended wording proposed. I think some of us have not studied this as carefully as we should. My good friend, O'Keefe, as evidenced from his remarks, hasn't looked into it. I want to say I have in my hand here a catalog of one of the largest vehicle tank builders in America. As evidenced by this catalog, many of the largest oil companies are using these trucks. Their practice is to exclude the piping.

Now, on the point that Mr. O'Keefe expressed. Your present specification reads as follows. [Reads specification 9 as proposed by committee.] Who is going to be there to see whether the valves are open or not when the filling takes place? The very minute that truck driver goes beyond a certain point he can close the valves and open the lines. Mr. Holbrook said there was a splendid opportunity for fraud when open lines to empty compartments led into a manifold. The identical opportunity exists here. Dr. Dickinson in his talk today dwelt on this very thing, stating that the fire underwriters recommended that the piping be closed. Furthermore, a certain State does not allow tank wagons to go on its highways unless the truck is equipped with valves to prevent the gas going into the lines.

Here is a city where it is provided that no automobile tank truck, or trailer on same, shall be registered for the year 1932, or thereafter, nor shall any such vehicle be operated on the public highways subsequent to its registration, unless it is in compliance with the following minimum specification. Now see what the minimum specifications are:

Every compartment of a gravity discharge tank shall be provided and equipped with a sufficient shut-off valve located in the compartment outlet, except it be

Digitized by Google

located in the shell of the tank compartment, and except during the delivery operation, such valve shall be automatically kept closed.

In other cities and in the New England States, I find they have similar requirements.

Gentlemen, why should not a compartment be equipped with a shut-off valve? Then the line can be left empty. When a man gets up on top of the truck to look at the indicator, he can see whether the valve is closed. When this specification was formerly adopted, you were accustomed to find a great deal of leakage in these valves. The present-day valves are positively leakproof. We checked a vehicle tank that drove 6 miles over rough streets; when it arrived at the point of unloading, the gas was just breaking away from the indicator. I opened the valve and out of the pipe line I didn't get a pint.

The company I mentioned a short time ago—the largest I know of—will guarantee you an emergency valve-control mechanism; their tanks are equipped with this valve. I want to tell you that I am just as much interested in the manufacturer as I am in the customer.

All you sealers know there is a lot of difference between a man behind a desk and the man who sells his wares. There is a lot of difference in sitting there and in going out in the field and seeing action. I am not a technical man, but as a man working in the field I do know a little about this subject. If there is any chance of perpetrating fraud with a manifold of the type described, there is the same chance presented in the construction required by this specification.

Mr. O'KEEFE. If there isn't anything very serious about it, and there is no chance of fraud, why not leave those provisions in there, and let the fellow making the tests find it out; that is, if you follow out your specifications.

Mr. GRIFFITH. Might I say to Mr. O'Keefe, that if the pipes are part of the measured capacity, there is a chance of fraud. They close off the pipe, then drain the piping, and you find that much is gone.

But if you calibrate with the valve closed and the pipe empty, you check that.

Mr. HOLBROOK. The first requirement of the amendment proposed by the motion, is that all tanks be equipped with control valves. The evidence before the committee is, that while the control valve is very common in the east, it is very rarely used in the west; the estimate was made that only twenty to twenty-five percent of the vehicle tanks throughout the country are equipped with control or emergency valves at the present time. I think this first portion is not a proper weights and measures regulation. As I understand it, the control valves or emergency valves are for safety purposes solely. Therefore, it seems to me, if this Conference goes on record as requiring control or emergency valves it will be passing a safety regulation rather than a weights and measures provision.

Now as to whether piping should be full or empty. The committee spent a lot of time on that, and perhaps the factor which governed the committee in its decision that the specification should remain unchanged was the partial compartment delivery.

When a partial compartment is sold, the determination of delivery is very frequently made with a gage stick. When the compartment has been calibrated with the delivery pipe empty there is no ready means to correct for the variance caused by the filling of the piping;

Digitized by Google

that is, we have this condition existing. [Draws diagram on blackboard. See fig. 7.]

Now you start with the compartment filled to this point [indicating "indicator"], and this valve [indicating "emergency or control valve"] closed, and this pipe [indicating "delivery piping"] empty of liquid. When you open the emergency valve, as I designate it, or the control valve, as some of you prefer to call it, the liquid drops down to a point somewhat below the indicator and the delivery piping fills with liquid. Then you open the delivery valve located at the rear of the truck [indicating] and a certain amount of liquid flows into the underground tank of the service station, and the level of the liquid in the compartment falls to some point such as this [indicating

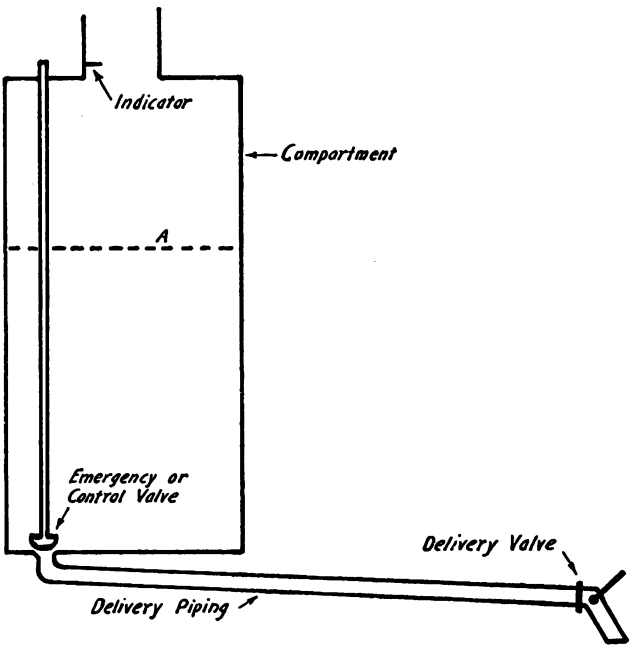


FIGURE 7.

dotted line "A"]. Now you close the delivery valve and "stick" the compartment to find the amount of gasoline supposedly delivered. What you do in effect is to measure the capacity contained between those two points, the indicator and the subsequent level of the liquid; in other words, the liquid which has flowed out of the compartment. But this delivery piping is now full, and it was empty at the start. So included in the measurement is the amount now remaining in the piping. The first purchaser inevitably loses the amount of liquid contained between the emergency valve, and the delivery valve on the back of the truck.

Mr. RAGLAND. If the absence of a control valve facilitates the perpetration of a fraud, it is a weights and measures problem.

Mr. HOLBROOK. As outlined, it is not a weights and measures issue, gentlemen, I submit.

Digitized by Google

Mr. GRIFFITH. If one purchaser gets less than he is entitled to, it is obvious that some other person gets more. Now, does the committee proposal prevent that discrepancy?

Mr. HOLBROOK. Yes; if you start off with the delivery piping full, then this line is full at the beginning and the end of a partial delivery. The gage stick is calibrated on this basis. It then measures the amount of liquid delivered each customer.

Mr. GRIFFITH. You already said one customer gets more and the other less.

Mr. HOLBROOK. The first customer gets short measure. If the remainder of the liquid in the compartment is eventually delivered on that same trip and the compartment and line emptied, then the last customer gets over measure. If they carry that compartment back partially full, then the amount in the line is retrieved.

Mr. GRIFFITH. That is a polite word, "retrieved". I agree with you when you say that some of the tank vehicles are not equipped with control valves. Therefore I have rewritten this specification 9 in a few words, which I think will cover that point, and with the permission of Mr. White, I would like to substitute this wording:

Specification 9. Piping.—Vehicle tanks equipped with control or emergency valves, shall have such valves at the lowest point of outlet from each compartment, and the capacities of such compartments shall be construed as not including the capacity of the piping leading therefrom.

Mr. HOLBROOK. I think those first words very necessary, since emergency valves are not made mandatory. However, you still have not met the problem of short measure to the first purchaser of a partial compartment, when a gage stick is used for finding the amount of the delivery. A portion of his delivery will be trapped in the delivery line.

Mr. ENGELHARD. You certainly will not open the control valve until you are ready; when it is closed, what remains is evidenced by the stick. You have an exact amount there, the quantity measure.

Mr. DICE. Anybody knows that the number of times the measuring stick is used to determine partial compartment deliveries is very small. In the first place, liquids of dissimilar gravities will not fill the lines to the same point, and on the first opening of the emergency valve between a full compartment and an empty line it is likely that more or less air would be compressed and that a greater or lesser amount of liquid would enter the pipe. In the second place, the piping is not put in as part of the capacity of the measuring unit. In the third place, just because reliable tank manufactures do or do not include the piping in their measurements, is no reason why this association should follow their practice.

I believe that in the State of New Jersey emergency valves are looked upon as a fire-hazard proposition. They are safety valves. I believe that the compartment alone should be used as the unit of measure, and that a vehicle tank should be so calibrated.

To get a proper filling of the drain line, you must first open the drain valve so that the air is all eliminated from the line, and then refill the compartment up to the mark; then you calibrate to the outlet valve. Vehicle tanks are not so used in practice. The filling is done with a closed emergency valve. Even with the emergency valve open, some air would be compressed in the line and the compartment and line would not be properly filled. I don't see that the pipe should have anything to do with the capacity.

Digitized by Google

Mr. BEEBE. Is the use of a measuring stick for the sale of liquid an approved method?

The CHAIRMAN. No; I think not.

Mr. BEEBE. Why consider it at all?

Mr. HOLBROOK. Because this Conference should face the facts and recognize that measuring sticks are actually used, in sales of partial compartments.

Mr. BEEBE. It is illegal.

The CHAIRMAN. I don't think it is, in some places. I imagine that in a very large number of jurisdictions it is not illegal at all.

Mr. GRIFFITH. It is unreliable and not approved.

Mr. RAGLAND. Do you know of any oil company that would approve a gage stick; that would use it on one of their trucks and accept the result? If you are going to allow people to use an approximate measure, then we are in trouble.

Mr. HOLBROOK. The question is how one is going to sell a partial compartment, under the construction contemplated in the amendment, without short measure resulting. In these times it is very probable, indeed, that partial compartments will be sold to service stations, many of which have no credit but are allowed to buy only for spot cash. In very many cases, unfortunately, their cash is not sufficient to enable purchase of a full load.

Mr. WHITE. I disagree with the opinion of Mr. Holbrook as to whether we have a right to require the installation of these so-called "control valves." I believe we have a right to consider anything of this kind when we consider it would prevent fraud.

Mr. HOLBROOK. I do not see how the installation of a control valve prevents fraud.

Mr. BAUCOM. Gentlemen, some city ordinances have been passed making it mandatory that all kinds of safety devices be on a tank wagon. Other jurisdictions do not have such ordinances. In requiring that tanks be equipped with safety valves or control valves, you must remember we are setting up a regulation to cover tank wagons in all territories.

Mr. GRIFFITH [interposing]. The proposal applies only when they are so equipped.

Mr. BAUCOM. I recognize that point. The majority of tank wagons within the United States are not so equipped. Your action will be used as a sales talk for selling these devices to be put on wagons. In my State we have about 200 of these bulk tanks, and if we are called upon to calibrate and certify the quantity of the tank, we must start at a definite point. There is often something faulty with these valves. They will not work. Purchasers of gasoline in quantities may even cause those valves to leak, so as to get that much more gasoline.

We should accept the specification as the committee recommended.

Mr. DICE. I believe that it is our job to inspect or test instruments as we find them, so we test tank wagons as we find them. I for one don't propose to be a party to recommending certain devices to gasoline companies and to manufacturers. That is something that does not come under the head of weights and measures administration.

I assume that these gentlemen that are on this committee are not novices, and it is evident that they studied this thing thoroughly. I am perfectly willing to accept their thoughts on the matter and I

Digitized by Google

think the body, as a whole, should do so. They gave it their time and attention and brought out what they thought was best for all concerned.

The CHAIRMAN. Gentlemen, as the matter now stands, Mr. Griffith's motion is in order, since Mr. White agrees to pass his motion.

(The question was taken by yea-and-nay vote, and the issue was in doubt. Thereupon a rising vote was taken, and, upon the count showing 32 in favor of the motion and 28 opposed, the motion was agreed to.)

(At this point motions were made and seconded to adopt specifications 10 and 11, as proposed by the committee. The questions were taken, and the motions were agreed to.)

Mr. HOLBROOK. In relation to specification 12 I may say this has been amplified, because it has been pointed out that the language at present in effect permits the return of the indicator to zero in either direction; in other words, it seems that the indicator might be advanced by manual means thereby making it possible to increase the indication of the amount delivered to the purchaser.

Mr. BAUCOM. I think compliance with the proposed requirement is practically impossible. My friends might not agree. The manufacturer will have to put some sort of a shield over the face in order to turn it back to zero.

Mr. HOLBROOK. That is only in case the return is to be made in a forward direction. You have to obscure the indication only when you advance the indicating element by manual means.

(The specification as proposed by the committee was duly adopted.)

(The same action was taken in relation to specifications 13 to 17, inclusive.)

Mr. BUNDENTHAL. Although we have passed section 14, in view of the discussion on section 9, I cannot refrain from suggesting that under the provisions of section 14, there is a good possibility of fraud. We are providing for the use of wet hose which may be perhaps, 50 feet long. If you start with the hose empty, and when you finish have it full, that might be another way of "retrieving" an amount of liquid, in this case equal to the capacity of the hose.

Mr. HOLBROOK. The specification provides for a spring-loaded check valve at the end of the hose, so that the hose cannot be drained.

Mr. BUNDENTHAL. When you fill your tank there is no liquid in the hose.

Mr. DICE. When the tank is emptied the hose and meter would be left full.

Mr. GRIFFITH. Specification 14 applies to tank trucks equipped with meters, whereas specification 9 refers to tanks without meters; that is, those which are used as measures.

Mr. BUNDENTHAL. If you start with an empty tank, of course, your hose is also empty; then your hose fills up, the meter records the amount which goes into the hose, but the amount in the hose is not delivered.

Mr. GRIFFITH. You cannot drain the hose on account of the valve at the end.

The CHAIRMAN. Does the Conference desire to go back to specification 14? If so, a motion to that effect is in order. Otherwise we will keep going forward.

Digitized by Google

Mr. GRIFFITH. Let us go forward, Mr. Chairman.

(Mr. Holbrook reread the material under the heading "Tolerances.")

Mr. GRIFFITH. The tolerances as specified only go up to 1,500 gallons. We are now confronted with calibrating trucks with capacities up to 4,000 gallons. Did the committee give any consideration as to tolerances to be allowed beyond 1,500 gallons? The tolerances given in the table, as I see it, could be extended indefinitely.

Mr. HOLBROOK. Yes; the table could be continued, if you like. We could lay out several tolerance values for greater capacities on the same scale.

Mr. GRIFFITH. Let us include say, 2, 3, and 4 thousand gallons. I move you the adoption of the tolerances as recommended by the committee.

(The motion was seconded, the question was taken, and the motion was agreed to. The same action was taken in relation to the material under the heading "Regulations.")

ANNOUNCEMENTS

The CHAIRMAN. The secretary has an announcement to make.

Mr. HOLBROOK. An unfortunate mistake was made in printing the program of the Conference. The Executive Committee as printed in this program is the Executive Committee of the Conference held in 1930, not of the last Conference, held in 1931. In other words, the names of several who are on the present Executive Committee this year, are not recognized as being on the Executive Committee by this program. To correct these omissions, we have had a correct list of the members of the Executive Committee printed and have pasted this on some of the copies of the program. Anyone desiring a copy of the corrected program may obtain one at the secretary's table.

DEMONSTRATIONS OF RECENT DEVELOPMENTS IN LIQUID-MEASURING DEVICES, BY REPRESENTATIVES OF MANUFACTURERS

SECRETARY'S NOTE.—At this point several manufacturers brought before the Conference samples of liquid-measuring devices and attachments embodying new design features, and demonstrated them to those in attendance. Particular attention was given to the new features incorporated, the method of manipulation of the adjustments provided, and the answering of questions asked by members. As was the experience in former cases, it was found that, in general, the remarks made are of no value to a reader when a sample of the product is not before him, and thus no good purpose would be subserved in printing such material here. Consequently it has been decided to omit this material from the report.

It may be noted that such demonstrations as these, which familiarize the delegates with new apparatus, are of great interest and value to them. Attendance at the Conference is the only way in which full advantage can be obtained from program features such as this. The delegates were duly appreciative of the efforts of the manufacturers who took part in this demonstration.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON MODIFICATION OF CODE FOR LIQUID-MEASURING DEVICES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN

Mr. Chairman and gentlemen, you have in your hands the report of the committee, containing recommendations for amendments proposed in the code for specifications, tolerances, and regulations for liquid-measuring devices. That report contains all the specifications

Digitized by Google

which are recommended to be modified by the committee, presented in their amended form.

Formerly, our liquid-measuring device code has been applicable only to retail devices. Now it is recommended that it include requirements for both retail and wholesale devices. Consequently the definition has been appropriately modified.

In general, the first specifications to be encountered will be recognized as those applicable both to retail and to wholesale devices. There will then be submitted specifications referring to retail devices only. Finally there will be presented for consideration specifications referring to wholesale devices only.

(Signed) F. S. HOLBROOK, *Chairman*,
JOSEPH G. ROGERS,
JOHN P. MCBRIDE,
GEO. F. AUSTIN, Jr.,
Committee on Specifications and Tolerances.

DISCUSSION OF ABOVE REPORT

Mr. HOLBROOK. Mr. Chairman, I feel that we will save time if we consider these paragraphs as we go through them, thus rendering it unnecessary to read the code twice.

The first specification recommended for amendment is 4, "Units of Delivery." It is proposed to amend this to read as follows:

4. Units of Delivery.—*Liquid-measuring devices shall have the following discharge capacities per stroke or per cycle of the primary indicating elements, and these only: 1 gallon, a multiple of the gallon, 2½ gallons, or a binary submultiple of the gallon, that is, the quantity obtained by dividing the gallon by the number 2 or a power of the number 2: Provided, however, That a device may be constructed to deliver other amounts than the above, corresponding to predetermined money values at a definite price per gallon, but in such cases the device shall be so constructed that the price per gallon at which it is set at any time will be clearly indicated to the customer by automatic means. Fractional parts of a gallon may be indicated in terms of decimal or binary-submultiple subdivisions. In the case of a wholesale device, the value of the smallest unit of indicated delivery shall not exceed 1 gallon.*

(The specification as proposed by the committee, was duly adopted.)

Mr. HOLBROOK. The next specification is to be applicable to retail devices only.

5. Device to Indicate When System Is Properly Filled.—*Retail devices other than those of the visible type shall be equipped with a device which will indicate whether or not the system is properly filled before a delivery is begun. This specification shall not be construed to prohibit a manually-operated valve in the standpipe, but shall prohibit a check valve in the discharge line in such a position that the partial emptying of the system would not be disclosed: Provided, however, That a check valve in the discharge line shall be permitted when an efficient air eliminator or other means is provided to prevent inaccuracies of measurement due to air or vapor in the liquid.*

(The specification as proposed by the committee, was duly adopted.)

Mr. HOLBROOK. The next specification is entirely new material.

Prevention of Registration of Air.—*In any installation of a meter-type liquid-measuring device, adequate means shall be provided for preventing the passage of air or vapor through the meter. When gravity discharge is employed, if a mechanical air eliminator or other means to prevent inaccuracies of measure due to air or vapor in the liquid be not provided, provision shall be made for preventing a vortex at the point of discharge from the supply tank whereby air might be drawn into the line leading to the meter, and the meter shall be so mounted and the piping so arranged that the meter will not be drained of liquid during normal operation and that air will not be trapped in the meter inlet when the supply tank is filled. In a pump-discharge unit a mechanical air eliminator or other means shall be installed adjacent to the meter inlet.*

Digitized by Google

The air eliminator or other means shall be considered effective if the provisions of specification 8 are complied with.

(The specification as proposed by the committee, was duly adopted.)

Mr. HOLBROOK (reading):

8. Constancy of Delivery.—The amounts delivered by any liquid-measuring device shall not vary from the standard by more than the tolerances hereinafter provided (1) irrespective of whether the discharge of liquid is continuous or intermittent, (2) irrespective of the speed at which the device is operated, except that when operated considerably faster or slower than normal speed of operation the tolerance shall be applied in deficiency only—that is, the device shall not be deemed to be incorrect by reason of the tolerance in excess being exceeded during such unusual methods of operation—and (3) irrespective of the time elapsing between operations, subject to the conditions of the special elapsed-time test described below.

A special elapsed-time test shall be made to determine whether the device is satisfactory with respect to condition (3) above. In order to comply with this test the condition of the device shall be such that the error resulting from the nonuse of the device does not exceed 2 cubic inches per hour in the case of a retail device and 5 cubic inches per hour in the case of a wholesale device: Provided, however, That in the case of a new device the permissible errors shall be one-half the values given above.

"Normal speed of operation" shall be construed to mean that range of operating speeds which may reasonably be employed in ordinary commercial usage; in the case of meters used for the purpose of determining the quantity of liquid delivered to an individual purchaser, this shall mean operation within the limits of the discharge rates ordinarily developed under conditions of installation recommended or specified by the manufacturer for the particular type of meter under test, *and all such meters shall be legibly marked to show the maximum discharge rates under normal conditions of installation and the minimum discharge rates and the maximum working pressures for which they are intended to be used: Provided, however, That in lieu of the maximum rate the words "full flow", or similar and suitable words may be used: And provided further, That in the case of retail devices the value of the minimum rate shall not exceed 7 gallons per minute, and in the case of wholesale devices not exceeding 2½ inches in size, the value of the minimum rate shall not exceed 20 gallons per minute. On meters larger than 2½ inches in size the value of the minimum rate should be governed by the character of use of the meter.*

NOTES.—In the special elapsed-time test described above, allowance shall be made for errors due solely to a change in volume of the contained liquid, resulting from temperature variations alone, since an error of this character is unavoidable in the case of volumetric measurements of this kind when the apparatus is standing unused. This change in volume due to temperature variations is, however, small in amount for all ordinary variations of temperature, amounting in the case of gasoline to about 0.6 percent for each 10° F change of temperature, or about 1.1 percent for each 10° C change of temperature.

In applying the elapsed-time test outlined above it is recommended that the delivery be not made through a hose, since the amount of gasoline necessary to wet the inside of the hose will cause an additional shortage in the delivery.

All meters encountered in the field should be tested at the maximum discharge rate developed under the conditions of installation actually employed regardless of whether this rate exceeds or is less than the maximum discharge rate marked on the meter, and also either at the rate of 7 gallons per minute, for retail devices, or at the rate of 20 gallons per minute, for wholesale devices not exceeding 2½ inches in size, or at any lower discharge rate marked by the manufacturer.

The specification has been modified only insofar as is necessary to incorporate appropriate provisions for meters of the wholesale type.

(The specification as proposed by the committee, was duly adopted.)

Mr. HOLBROOK (reading):

9. Indicating and Registering Parts.—Counters, graduated scales and dials, and reading faces, used on liquid-measuring devices to tally sales and deliveries to individual purchasers or to indicate the amount delivered when any portion

Digitized by Google

of the cycle or stroke has been completed, or the unit price or the total price thereof, shall be of such size and style and shall be so located and disposed that they are clearly visible to and readable by the customer from any position which he may reasonably be expected to assume; *in the case of a retail device this position shall be construed to mean any position within a field of 120 degrees, defined by two vertical planes each at an angle of 30 degrees with the counter, graduated scale or dial, or reading face, and passing through the center thereof.* The graduations shall be of such character and arrangement that the major ones *are more prominent than and* are clearly distinguishable from the minor ones. *In all types of liquid-measuring devices which have a graduated scale which at some point or points or at all points constitutes the sole or most sensitive means of determining the amount of liquid discharged, the width of the graduation marks shall not exceed 0.04 inch.*

That specification has been modified in two respects: First to make it applicable to the new computing units; second, to define the position which may be said to be reasonable for the purchaser to assume during a delivery.

(The specification as proposed by the committee, was duly adopted.)

Mr. HOLBROOK. The next specification is new material.

Interlocking of Registering Elements.—*A liquid-measuring device in which is incorporated (1) a computing mechanism which indicates the total price of the amount of commodity delivered, for one of a series of unit prices for which the mechanism is set, and (2) a unit price mechanism by means of which one of the various unit prices is displayed on the device, shall be so designed and constructed that these two mechanisms are mechanically interlocked so that when the computing mechanism is set for a certain unit price, this unit price and no other shall be displayed on the device.*

(The specification as proposed by the committee, was duly adopted.)

Mr. HOLBROOK. Now I have one amendment to propose to material not in your hands. That is an amendment to specification 10. The following words are suggested to be added, at the end of the present specification:

or if the construction is such that the indicator and the graduations are in the same plane, then there shall not be a separation of the ends of the graduations and the end of the indicator of more than 0.04 inch, this distance to be measured along the line of the graduations.

It is customary in our specifications referring to indicators and graduations to have that language included, and it is proposed to be included here to make our various codes uniform in this respect.

(The amendment was duly adopted.)

Mr. HOLBROOK. The next amendment to be proposed is also not in your hands. It is proposed to amend specification 12 by incorporating therein the words "which is intended to be stationary in the normal use of the device" to make the specification read as follows:

12. Graduated Scales.—When a liquid-measuring device is provided with a graduated scale or dial which is intended to be stationary in the normal use of the device, this shall be riveted to its supports or otherwise permanently fixed in position: Provided, however, That in the case of liquid-measuring devices of the gauge-glass type a sliding scale will be permitted when the displacement of such scale is, by suitable means, automatically prevented at all times when liquid is being discharged from the delivery outlet.

That is purely a corrective amendment. The original meaning of the paragraph is unchanged.

(The amendment was duly adopted.)

Digitized by Google

Mr. HOLBROOK. The next specification is intended to apply only to retail devices.

16. Return of Indicating Element to Zero.—Retail devices shall be so designed and constructed that the indicating elements used to tally sales and deliveries to individual purchasers or to indicate the amount delivered when any portion of the cycle or stroke has been completed, or the unit price or the total price thereof, shall be returnable readily to a definite and clear zero indication before the next delivery is begun. *Means shall be provided to prevent the indicating element from being returned beyond the zero graduation. The indicating elements may be advanced only by the mechanical operation of the device itself:* Provided, however, That the device may be cleared by advancing the indicating elements, but in this event the registration shall be obscured and remain obscured until the zero is reached.

(It was moved and seconded that the specification as proposed by the committee be adopted.)

Mr. RAGLAND. Mr. President, I am going to ask to amend that section, prompted by being so much influenced by a demonstration given us by one of the oldest men of this conference, a man loved by everybody, a friend of every scale man and every weights and measures man, and an old sealer himself. I think the amendment I am going to offer will be satisfactory to the specifications and tolerances committee, because they have labored under a false idea. That idea has been entirely removed here today. If I am making a mistake, Mr. McBride, please correct me.

At the end of the first sentence following the words, "before the next delivery is begun", I move the insertion of the words, "and means shall be provided to prevent the delivery of another sale until the indicator has been returned to zero."

I am going to ask that, and then I am through.

Mr. HOLBROOK. The committee gave consideration to the amendment proposed by Mr. Ragland, and found out that there was a patent situation involved with which the committee was not familiar. Moreover, the committee did not have time to determine what effect that amendment would have upon the various devices in use and now being manufactured. The committee decided to its own satisfaction that it would be preferable to wait another year before making any recommendation whatever to the Conference in this regard.

Mr. HARRISON. If I read this correctly, the committee proposes that the "unit price" be returnable readily to zero before the next delivery is begun. I hardly think the committee intended that.

Mr. HOLBROOK. The words "or the unit price", do not belong there. Thank you, Mr. Harrison.

The CHAIRMAN. The motion before the house, then, is to insert after the word "begun" in the first sentence, the words "and means shall be provided to prevent the delivery of another sale until the indicator has been returned to zero" and to eliminate the words, "or the unit price."

(The question was taken and the motion was agreed to.)

Mr. HOLBROOK. On a point of information: Are the words added by Mr. Ragland to be retroactive or nonretroactive?

Mr. ROGERS. I move you they be nonretroactive, on account of the number of devices on the market that do not comply with the specification as amended.

Digitized by Google

(The motion was seconded, the question was taken, and the motion was agreed to.)[11]

Mr. HOLBROOK. The next specification refers to retail devices only.

26. Computing Charts.—*When retail devices are equipped with money-value computing charts these shall be made in accordance with one of the following principles:*

(a) If the device is so designed and constructed that it purports to compute for one or for a series of unit prices the total price for every delivery within the range of the device, then the device shall be equipped with a value pointer or indicator and value graduation marks and figures; and in any position which the indicator or pointer and the value graduation marks and figures may assume, the total price of the amount delivered shall be clearly, definitely, and correctly indicated. The value graduations shall not exceed 1 cent at all prices per gallon up to and including 30 cents. At any higher price per gallon the value graduations shall not exceed 2 cents: Provided, however, That nothing in the above shall be construed to prevent the placing of a special value graduation to represent each 5-cent interval. These special graduations may take the form of dots, staggered graduations, or similar forms. They shall be so placed that their meaning and value may be clearly understood, but they shall not be placed in the space between the regular graduations.

Paragraph (b) of this specification is not proposed to be amended.

(The specification as proposed by the committee, was duly adopted.)

Mr. HOLBROOK. We now have a group of specifications intended to be applicable only to wholesale devices. This material is all new.

Indication of Delivery.—Wholesale devices shall be so designed and constructed that the amount delivered shall be clearly and definitely indicated.

(The specification as proposed by the committee, was duly adopted.)

Mr. HOLBROOK (reading):

Sensitiveness.—Wholesale devices shall be so designed and constructed that they can readily be operated to deliver an amount of 50 gallons within the tolerances on such amount hereinafter provided.

(The specification as proposed by the committee, was duly adopted.)

Mr. HOLBROOK (reading):

Testing Drafts.—In the test of a wholesale device, the minimum testing draft shall be 50 gallons.

NOTE.—In general it is recommended that in the case of wholesale devices having high discharge rates the size of the regular testing draft should be increased to 100 or even several hundred gallons. The greater the discharge rate the more desirable it is to increase the size of the testing draft.

(The specification as proposed by the committee, was duly adopted.)

Mr. HOLBROOK (reading):

TOLERANCES

Except in special tests described above, the tolerances to be allowed in excess or deficiency on all liquid-measuring devices shall be the values shown in the following table: Provided, however, That the manufacturers' tolerances or the tolerances on all new liquid-measuring devices shall be one-half of the values given: And provided further, That these latter tolerances shall also be applied to all devices which are being retested after having been found incorrect and subsequently adjusted or repaired.

[11] For final action of the conference on specification 16, see p. 101.

Digitized by Google

Retail devices		Wholesale devices—Tolerance
Delivery	Tolerance	
Gallons	*Cubic inches*	
½ or less	2	1 cubic inch per indicated gallon. (Minimum tolerance 50 cubic inches.)
1	3	
2	4	
3	5	
4	6	
5	7	
For each additional gallon add 1 cubic inch.		

(The tolerances as proposed by the committee, were duly adopted.)

MOTOR-TRUCK SCALES AND NATIONAL SCALE MEN'S ASSOCIATION ACTIVITIES

By M. J. J. Harrison, *Chairman, Committee on Yards and Terminals, American Railway Engineering Association*

Mr. President and gentlemen of the Conference, while I am entitled on the program of this Conference as chairman of the committee on yards and terminals of the American Railway Engineering Association, and while much of what I may say this afternoon may be from the point of view of that organization, a complete discussion of the topic assigned me requires that I go beyond the scope of any single organization. With your indulgence, therefore, I shall attempt to discuss the subject of "motor-truck scales" somewhat broadly, and to indicate to you some of the more interesting and important steps in the development and progress of designing and testing this class of weighing equipment which have been originated and sponsored by organizations other than your own.

First of all, it might be timely to explain why a railway organization should apparently be interested in a facility which is, at least at first thought, primarily an adjunct to highway transportation. Secondly, a word of explanation as to why a railway employee should be asked to speak to you on this subject might be appropriate. Such comments seem especially fitting because, as far as I personally recall, the activities of the American Railway Engineering Association as related to the aims of this Conference have not previously been formally brought to your attention, and, further, because I note the presence of many new faces in your present gathering—to the owners of some of which it may not have occurred that the railways of the country took any active interest in the design of weighing equipment.

The American Railway Engineering Association is a voluntary organization composed of some 2,000 members who are engaged in railway work in an engineering capacity or who are otherwise eligible to membership in the Association. Organized in 1899, it existed as an independent body, although informally allied with the American

Digitized by Google

Railroad Association until 1920. At that time, at the termination of Federal control of railways and with the general reorganization of the American Railroad Association which then occurred, the American Railway Engineering Association was, to all intents and purposes, constituted the Engineering Division of the American Railway Association. With the further reorganization of the American Railway Association in 1934, the American Railway Engineering Association became substantially the Engineering Division of the Association of American Railroads.

Since at least 1912 the Association of American Railroads, by whatever name it was known or however it was organized, had given formal attention to weighing and to weighing equipment, concentrating in the earlier days on track scales. When the American Railway Engineering Association became a virtual unit of the American Railway Association in 1920, the work of preparing the track-scale specifications subsequently issued by the National Bureau of Standards as its Circular 83, had just been completed, and there existed within the Engineering Association a small group which, as a subcommittee, had collaborated in that preparation. It is possible that knowledge of the existence of that group prompted the executives of the newly reorganized American Railway Association to allocate in 1920 to the American Railway Engineering Association, as its engineering division, the handling of matters pertaining to weighing equipment. In any event, this allocation was made, and in the American Railway Engineering Association the subject was assigned to the standing committee of which I have the present honor to be chairman—the committee on yards and terminals.

The American Railway Engineering Association, having finished a work of considerable importance with the completion of its contribution to Circular 83, and feeling that, at least for the time being, there was nothing further to be done or said in connection with railway track scales, turned its attention to other forms of weighing equipment used by railways. Substantially the same reasons which had prompted the preparation of specifications for track scales suggested the preparation of specifications for other types of scales, and the result was a document, produced by the subcommittee mentioned a moment ago, and adopted and issued by the Association in 1923, under the title "Specifications for the Manufacture and Installation of Motor Truck, Built-In, Self-Contained and Portable Scales for Railway Service."

In presenting its report to the Association, the committee said, in part—

> While your committee was not expressly directed to consider the subject of motor-truck scales, it became apparent that the now heavy current use of motor trucks made such consideration highly pertinent, particularly as specifications for motor-truck scales have so many provisions in common with the various types of depot scales. Your committee, therefore, so drafted its specifications as to include the essential provisions for standard motor-truck scales.
>
> The problem of selecting standard sizes and capacities for motor-truck scales is somewhat different from that of the other types of scales, as no great variety has yet been manufactured.* Considerable data was collected as to all motor-truck scales now in use or contemplated, and as to present and prospective highway-bridge and roadway limitations, and it was found that the essential types of motor-truck scales naturally fell into three main classes or capacities,

* It should be kept in mind that this paragraph was written in 1922.

Digitized by Google

i. e., for the 3½-ton trucks, the 5-ton trucks, and the 7½-ton trucks. A study was made as to the spacing of wheels, disposition of loads on the axles, and the amount of overload used, and typical diagram was prepared for each class of trucks.

The report then goes on to explain the reasons for selecting the various platform sizes and scale capacities which were set forth in the specifications as standard for railway service—in other words, the preferred sizes and capacities.

It will be noted from the excerpt just quoted that some doubt must have existed in the minds of the committee members as to the advisability of including motor-truck scales in their proposed specifications. However, the fact remained that the railways used a great many such scales, particularly at team track yards, and it was doubtless for this reason that the committee concluded to make its specifications inclusive.

In all frankness, it must be noted that the scale manufacturers were not entirely in sympathy with the specifications as adopted by the Engineering Association. There was a variety of reasons for this lack of complete sympathy, but this variety could be reduced in the final analysis to a dollars-and-cents basis. To explain: The 1923 specifications drew a very sharp distinction between scales of the motor-truck type and scales of the wagon type, and were largely predicated on the basic principle that the stresses produced in a scale structure by a loaded motor truck were materially greater than could be produced in the same scale structure by a wagon of equal gross weight. For this reason, therefore, for the same weigh-beam capacity, a motor-truck scale conforming to the 1923 specifications of the American Railway Engineering Association had to be of materially heavier construction than a so-called wagon scale of the same period. This, together with the fact that certain refinements of design and construction—all necessary in the judgment of the committee for enduring accuracy in the scale and for economical maintenance—were specified, made for a higher manufacturing cost (and a consequently higher selling cost) than the manufacturers were then willing to agree to. This situation led to the offering for sale by the manufacturers of two rather different lines of motor-truck scales, one spoken of as the "specification" line, the other spoken of as the "commercial" line. The specification line was the higher priced, and was considerably superior in quality. On the other hand, the commercial line, being lower priced, was easier to sell, especially in competition, since the prospective purchaser's immediate intelligent interest was often limited to two things—nominal capacity and first cost.

That this situation was disappointing can be easily understood. It is true that the original subcommittee had had clearly in mind the fact that, after all, they were writing specifications for railway application At the same time, a sincere effort has been made to take a broad view of the situation—with the hope that the principles of design embodied in the specifications and the preferred sizes and capacities listed therein would become nationally acceptable. It is not out of place to note here that the subcommittee which prepared these specifications actually was and is, the only organized technical group in the United States which might with any justification write scale specifications from the "user" point of view. Furthermore, the subcommittee had had the benefit of collaboration from both the Na-

Digitized by Google

tional Bureau of Standards and the National Scale Men's Association, and the further benefit of assistance on the part of technical representatives of the scale manufacturers. In addition to this, the specifications had been promulgated by the National Bureau of Standards as its Letter Circular 152.

In the mean time, however, the art of motor-truck design was progressing rapidly. Also, more and more attention was being paid by State highway officials to damage to pavements and bridges by overloaded trucks, and the matter of cost of highway structures adequate to carry the steadily increasing wheel loads became a serious economic problem. It appeared inevitable that a point must be reached, beyond which the weights of loaded highway vehicles might not go, and this was finally brought about through the American Association of State Highway Officials, whose recommendations have found expression in the legislative actions of many of the States.

At about this same time, the Federal Government started to purchase motor-truck scales and, for lack of anything else, specified conformity with the provisions of Bureau of Standards Letter Circular 152, which, as I have already mentioned, was the code of specifications originated and adopted by the American Railway Engineering Association. When proposals to furnish these scales were received from the various contractors and when such proposals were carefully analyzed (as is obligatory in the case of Federal purchases under any set of specifications), it was found that there were a number of points in the specifications as to which interpretation was necessary, and that interpretation frequently led to undesirable controversy. In short, on that count, the specifications were not satisfactory as a basis of contract.

After careful consideration of all the related facts, our subcommittee on scales decided, in about 1932, to undertake a general revision of the motor-truck scale specifications, and in March 1935, a new code of specifications for motor-truck scales was presented to and adopted by the American Railway Engineering Association. This was, of course, a substitute for the former code, adopted in 1923, which was withdrawn. In the preparation of the 1935 specifications, the subcommittee again had the benefit of collaboration by representatives of the National Bureau of Standards and members of the National Scale Men's Association, and in addition had closer cooperation on the part of the scale manufacturers than had been the case 12 years previously.

Fundamentally, the 1935 specifications prescribe the loadings promulgated by the Association of State Highway Officials, and are much more explicit than the former specifications in some matters, particularly with respect to weigh-bridge design. The list of preferred sizes and capacities is somewhat larger than was included in the 1923 code, nine different scales being now included in this group, while of additional interest is the fact that provision is made for the special condition of loading produced by the tractor and semitrailer combination. At the present time, I am happy to say, there is every prospect that these new specifications are being and will be much more favorably received than were the 1923 specifications, and the American Railway Engineering Association is optimistic that its latest effort in this line will serve to bring about a desirable improvement in the quality of motor-truck scale installations in the country

Digitized by Google

as a whole. If it has not already been done, the attention of the National Bureau of Standards will be formally called to the adoption of this new code, and it is hoped that the Bureau will see fit to withdraw its Letter Circular 152 and substitute therefor the new material.

In concluding this section of my remarks this afternoon, it is fitting that mention be made of the fact that specifications such as those about which I have been speaking are somewhat different in character than are the various codes of specifications adopted by this Conference, without, however, conflicting in any way therewith. In other words, the codes adopted from time to time by this Conference are intended to insure: (1) That devices are so made that they may readily be used for the purposes intended without the introduction of elements which would be detrimental to the accuracy of the results or to the interests of buyer or seller; (2) that devices are so made that they are reasonably permanent in their indications and adjustments; and (3) that devices are not so made that they are conducive to the perpetration of fraud. From the very nature of things, however, the specifications of this Conference must be general in character—they cannot be detailed. On the other hand, the specifications produced by the American Railway Engineering Association are intended as a detailed basis for purchase. They are intended to result in scales of the same quality or, if you please, value, being furnished for similar service. To state it in yet another way, they are intended to result in similar scales being furnished by any manufacturer under the same proposal. Hence, they go into such matters as details of loading, as working stresses for the materials ordinarily used in scale manufacture, as design loads for a given size of platform and a given weigh-beam capacity, as weigh-beam graduations, etc. They provide for an acceptance tolerance entirely consistent with that specified in Bureau of Standards Handbook M85, but, being intended as a purchase specification, are entirely silent in the matter of maintenance tolerances. However, the fundamental basis for the specifications is that compliance with their provisions shall result in a weighing machine which will more economically and for a longer period of time continue to reflect correct weights of motor trucks within the limits of error permitted by the tolerances adopted by this Conference, subject only to the proviso that the loads applied on the scale do not exceed those for which the scale is designed.

Mention of maintenance tolerances brings me to another phase of this subject, and to the activities of another organization which parallel and supplement those of this Conference. I refer now to the National Scale Men's Association, an organization which is presumably better known to the members of this Conference than is the American Railway Engineering Association, and whose interest in matters pertaining to highway weighing equipment is more easily understandable.

Something over a year ago, the attention of the National Scale Men's Association was formally called to the fact that there were often considerable disparities between weights of the same load as indicated by two different motor-truck scales, both of which had been approved by the weights and measures official having jurisdiction. In other words, taking a given load consisting of a heavily loaded motor truck, if this load were to be weighed on one motor-truck

Digitized by Google

scale, and immediately taken to a second scale and weighed, there would frequently be a considerable difference, even though both scales had recently been "sealed." To state the matter in yet another way, it appeared that large-capacity scales which had been tested and sealed by the weights and measures official would not necessarily weigh alike under practical conditions of use.

The National Scale Men's Association appointed a committee to look into this matter, and this committee (of which I was named chairman) gave the subject thoughtful consideration, finally concluding that much of the difficulty arose from the lack of adequate testing equipment on the part of those charged with the responsibility of seeing that the scales were weighing correctly.

This is a matter which has previously been brought to the attention of this Conference. To review briefly, it is a known fact that, in entirely too many jurisdictions, the quantity of available test weights is quite inadequate for an intelligent determination of the weighing performance of large-capacity scales, such as those of the motor-truck type, especially in the important upper range—that is to say, in the commodity-weighing range of the scale capacity.

With this in mind, the committee just mentioned set to work to define an adequate test of a motor-truck or a wagon scale. It prepared a report, which was submitted for discussion at the annual convention of the National Scale Men's Association 2 weeks ago, and which was given tentative approval after slight modification. It is the present desire of the committee to submit its preparation to this Conference (possibly through your Committee on Specifications and Tolerances), to the end that a mutually acceptable code may be agreed to and adopted. The National Scale Men's Association committee has been directed so to negotiate.

Rather than take up your time this afternoon by reading the entire proposed code, I would like to bring to your attention certain of its more important points. The code opens with the statement that an "ideal" test of a motor-truck or wagon scale would be a test to its full nominal capacity, using test weights exclusively. As a practical substitute, it is then pointed out that this can be approximated under favorable conditions by the use of an adequate quantity of test weights in conjunction with one or more "strain loads." Attention is directed to the fact that the test, to be satisfactory, must extend through the commodity-weighing range of the scale.

The next statement has to do with the minimum quantity of test weights of known value which can be considered as satisfactory for routine use with strain loads, and this is defined as 25 percent of the nominal capacity of the scale under test, with an upper limit of 10,000 pounds. It should be understood, of course, that this is not intended to prevent or discourage the use of more than 10,000 pounds of test weights if they are available; the reference is merely to the minimum requirement.

The value of the strain load or loads is then stated in this way: One strain load is to be used in any event when only part of the nominal capacity of the scale is represented by test weights, and the value of this strain load is required to be such that "strain load" plus "test weights" will at least equal the gross weight of the heaviest loaded vehicle weighed on the scale under test. Attention is called

Digitized by Google

to the fact that this total test load will generally approximate the nominal capacity of the scale.

A second and intermediate strain load is then required to be provided and used if the value of the first strain load exceeds twice the value of the test weights used in the test. As an illustration of how this would work in practice, let me state two examples.

Assume a scale with 24,000-pound nominal capacity, a maximum load to be weighed of 20,000 pounds, and 6,000 pounds of test weights available. One strain load must equal at least the difference between 20,000 and 6,000 pounds, or 14,000 pounds; 14,000 pounds, however, exceeds twice 6,000 pounds. Therefore, an additional strain load of approximately 6,000 pounds is required to be secured and used.

Assume, on the other hand, the same scale and the same maximum load to be weighed, but 10,000 pounds of test weights available and used. Under these assumptions, the strain load is required to weigh not less than 10,000 pounds, and no intermediate strain load is required.

With this statement of required loads, the code then goes on to detail the test procedure, in which there is nothing unusual except a rather definite statement to the effect that "corner tests" need not be made except for information in the event repairs or adjustments to the scale are necessary. The performance requirements are then stated substantially as they appear in Handbook M85 of the National Bureau of Standards, with the exception that the largest permissible value of the SR is stated in pounds as well as in terms of the value of the weigh-beam graduations.

The code then calls attention to certain miscellaneous details which are of importance, and concludes by citing the fact that several testing agencies have demonstrated the economy of using test weights of 500- and 1,000-pound denominations instead of the more usual 50-pound weights, and pointing out the necessity for providing appropriate means of transportation and devices for handling these larger weights.

It seems to the National Scale Men's Association that weights and measures officials cannot afford to ignore the fact that motor-truck weights have enormously increased, that motor-truck scales have correspondingly increased in size and capacity, and that the testing of these scales with a small quantity of test load does not necessarily correctly indicate the weighing performance of such scales under practical conditions of usage. The members of the Scale Men's Association frequently find themselves, if you please, in the position of holding the bag when the same vehicle fails to weigh the same on two different "sealed" scales. They have, through their committee, formulated a code designed to obviate their present practical difficulty in the matter, and earnestly request the support of this Conference in correcting existing faulty conditions.

This, gentlemen, concludes what I have to say at this time on the subject of Motor-Truck Scales, having indicated to you what one organization is doing to raise the standard of new installations, and what another organization is doing to bring about accuracy in existing as well as future installations.

At the suggestion of your secretary, I would now like to report briefly for the information of this Conference some of the activities

Digitized by Google

and accomplishments of the National Scale Men's Association since this Conference last met.

At the 1931 meeting of this Conference, the then secretary of the Scale Men's Association spoke of certain standardization work performed up to that time by his association, and mentioned specifically: (1) A code of specifications for the overhaul and repair of large-capacity scales; (2) a code of specifications for railway track scales for light industrial service; (3) a standard form for use in reporting tests of railway track scales and especially adapted for use by organizations which exchange reports of this character; and (4) a code of specifications for railway track-scale test-weight cars.

Since their preparation and adoption by the Scale Men's Association, the specifications for railway track scales for light industrial service have been endorsed by the American Railway Engineering Association, while the specifications for railway track-scale test-weight cars have been submitted to and adopted by the American Railway Engineering Association.

Since 1931 the National Scale Men's Association has completed: (1) A definition of a standard test of a railway track scale, which was subsequently adopted with slight modification by the American Railway Engineering Association; (2) a code of rules to govern the operation and maintenance of railway track-scale test-weight cars, which was likewise adopted with slight modification by the American Railway Engineering Association; and (3) a definition of a standard inspection and test of a hand-operated grain hopper scale, the status of which is expected to be advanced through contacts with authorized grain-weighing agencies. Other projects under way at the present time include the definition of a standard test of a motor truck or wagon scale (to which I have made reference earlier in these remarks), the preparation of a standard form for reporting tests of grain hopper scales, and the preparation of a standard glossary of scale terms. Progress has been made on each of these projects.

Both the American Railway Engineering Association and the National Scale Men's Association desire that the National Conference on Weights and Measures be assured that, in their respective fields, the aims of both associations are the same as the aims of the Conference—the continued advancement of accuracy, efficiency, and uniformity in weighing and in weighing equipment. May the three groups continue in the future as they have in the past to supplement each other's efforts to the common end.

The CHAIRMAN. Thank you, Mr. Harrison.

A BOARD OF ADJUSTMENT

By EDWIN C. EMHARDT, *Supervisor, Bureau of Weights and Measures, Philadelphia County, Pennsylvania*

Mr. Chairman and gentlemen of the National Weights and Measures Conference, I was put in office in Philadelphia about a year ago. I had nothing to guide me, except a little publication of the National Bureau of Standards given to me by Ralph Smith, entitled "Handbook 11, Weights and Measures Administration." By this book, my thought about weights and measures administration was directed to the fact that it is twofold. It is both regulatory and supervisory. A good deal of the discussion you have today concerns the regulatory

Digitized by Google

measures which are most important. If you could control the manufacturer of machinery that dispenses articles, so well that those machines would dispense without any chance of fraud, then your supervisory measures would become relatively unimportant. But when I read this book, I found that so much is put up to the weights and measures official, that his office becomes a very responsible one. Especially was it emphasized that supervisory work should not be neglected.

One of the important phases of supervisory work is the prosecution of offenders against the weights and measures laws. It appears that the matter of prosecutions is one which is especially susceptible of not being properly administered. When I took office, I was confronted with a situation, which, perhaps, is found to exist in any large city. Many thousands of violations were reported, and very few prosecutions resulted from these violations. I found that in 1 year there had been reported 18,000 violations, and as a result of that, there were just 49 prosecutions. So I was bound to give thought to the question as to how decisions as to prosecutions were to be arrived at, and especially whether this decision should rest on the judgment of one individual—the weights and measures official.

Now I have in mind, for instance, that there might be a wonderful judge who was very learned in the law, and yet if that judge were given entire authority, it might be that no crime would be adequately punished by that man. He might not have learned to take the responsibility of punishing even a murderer, adequately. So my conclusion was that you cannot safely leave the decision to an individual. Especially did I desire to avoid the responsibility of making these decisions myself. Frankly, gentlemen, I don't think I could prosecute anybody of my own free will. I could always find an excuse for a man—it is his first offense; he might have a family of 10 children; or it might be something else.

But in order to get away from this situation of having one person decide it, we had to devise some other plan; so this is the way we arrive at it. I think that such a plan should be adopted in every jurisdiction.

We have formed in the city of Philadelphia a group of men which we call an "adjustment board." This body is an entirely new feature in the administration of weights and measures inspection. Philadelphia's board hears all cases of violations of weights and measures regulations, having the authority to take action in one of two ways. It may either make summary adjustments of cases at the time of their hearing before the board, or it may decide that legal proceedings are necessary and direct that such cases be prosecuted in the courts. The action of any member outside of the bureau is, however, only advisory.

One of the most pertinent problems in the bureau's work is that of dispensing with legal violations. While rigorous inspection and complete record systems are essential components of administration, their effectiveness may be minimized if proper enforcement of the statutes enacted to protect the everyday buyer is lacking. Likewise, the possibility of stringent prosecutions for minor offenses also has its disadvantages. The burdening of magistrates with unnecessary work and the needless interference with merchants and dealers may

Digitized by Google

easily result in a general lack of cooperation with the work performed by the bureau. On the other hand, there is the ever-present pressure on the part of friends, political or otherwise, to intercede for violators of the ordinances enforced by the bureau.

The advisability of giving the bureau supervisor authority to make final decisions on such minor violations is decidedly questionable. The supervisor is subjected to political influences, and it is doubtful whether such an appointed officer should be given broad administrative powers without the provision of adequate safeguards to prevent the abuse of his authority. In one instance his action might be unnecessarily severe, while in others it might be weak or lenient, due to a fear of offending those interceding for the violator.

The handling of violations, therefore, and primarily those not demanding immediate legal action, has been vested in an impartial and unofficial adjustment board of 17 members. In addition to the bureau supervisor, deputy supervisor, and five district supervisors, the board's membership includes representatives of the following organizations: Retail Grocers' Association, Meat Dealers' Association, Philadelphia Commodity Administration, Reading Terminal Market Association, Fish Dealers' Association, Petroleum Code Administration, Chicken Dealers' Association, Coal Conference of Philadelphia, Coal Truckers' Association, and Coal Code Authority.

The board receives all the records of violations as transmitted by the district supervisors. At its meetings, held weekly on Tuesday morning, all cases are heard and the action to be taken in each instance determined. In many cases the board itself makes satisfactory adjustments, following which the violators are released with proper reprimands and detailed instructions regarding the practices to be followed in the future. In cases where the board decides that legal proceedings shall be instituted, affidavits are drawn and forwarded to local magistrates for hearings.

That the work of the board is of large volume and importance is evident. Of the 6,804 violations recorded during the year, a total of 3,142, or approximately 46 percent, were summarily adjusted by the board at the time of hearing. As a result of these adjustments the number of legal prosecutions has been reduced to a minimum.

The accompanying tabulation, which summarizes the prosecutions by classes and indicates the corresponding totals for fines collected, indicates that violations of a more serious nature are prevalent throughout the city and that many are being prosecuted.

Summary of total prosecutions, with fines and costs collected, year ending Apr. 30, 1935

Field of violation	Number of prosecutions	Fines and costs collected
Commodities	403	$2,678.00
Gasoline	109	1,080.00
Scales	32	387.00
Coal	1,121	13,404.00
Purchases	532	1,064.40
Total	2,197	18,613.40

Digitized by Google

While the tabulated record of prosecutions indicates the current need in many instances for the strict enforcement of the law for the protection of the buying public, the bureau trusts that the number of violations and the necessity for prosecutions will show a marked decrease in the future as merchants and dealers become better informed as to the regulations regarding short weight and measure and the penalties therefor.

The situation now is, that some of the things which in former years were recorded as violations, are not now included in the list of violations. For instance, we may find that a scale is off zero; or we find that certain corrections have to be made, and the scale is condemned for repairs. Now, of course, those are things that occur in the general use of scales; we would not necessarily bring that man before an adjustment board, or consider a prosecution. What we do is to consider the facts and determine whether there is a prima-facie case of violation of the weights and measures law.

I want to cite an incident which occurred this morning before I came away. There was a case of an absolutely purposeful violator, who had been ordered immediately before the board; his prosecution was ordered, and an affidavit made out. His case was numbered and put on a list which is prepared after the cases go before the magistrate, and which is presented to the board before they meet the following week so that each member knows what has happened to every case decided on the week before.

Now this morning, a person came into the office, who is one of my closest friends, a person who has spent a lot of money and a lifetime in welfare work, a fine person whom anybody would like to help. It developed that this violator was her nephew. Now, if there could be a case where we would want to serve a certain person, that particular person would be this splendid woman on account of the wonderful work she had been doing in the community. Yet there was no chance to take that case off that list without publishing it to everyone in the department, and arousing criticism. Moreover, it would have to be noted on the list presented to the adjustment board the following week. Hence the action taken will have to stand. The case goes before the magistrate tomorrow. The violator will be punished in accordance with law. You see the value of that procedure.

Gentlemen, it is an honor to work with you in this weights and measures work, and I hope you will all read our annual report for the last year. We have a supply here for you. I want to say we are all enthusiastic in Philadelphia today, to make weights and measures a real government service to all. I thank you.

The CHAIRMAN. Thank you, Mr. Emhardt.

(At this point, at 5:14 p. m., the Conference adjourned to meet at 9:30 a. m., Friday, June 7, 1935.)

Digitized by Google

SEVENTH SESSION—MORNING OF FRIDAY, JUNE 7, 1935

The Conference reassembled at 9:45 a. m., at the Washington Hotel, Mr. John P. McBride, presiding officer, in the chair.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON MODIFICATION OF SEVERAL CODES—Continued [12]

MILK BOTTLES

Mr. HOLBROOK. This report was first brought before you on Wednesday morning, at which time the first item, involving the striking out the 3-pint size in the case of bottles for milk or cream, was adopted. The next recommendation also has reference to milk bottles. It involves specification 3 and the material under the heading "Tolerances." It is proposed to strike out the references to the 3-pint size in these sections. This simply follows up and completes the action taken the other day.

(The amendments were duly adopted.)

Mr. HOLBROOK. The first portion of specification 3 reads as follows:

Milk bottles with an inside diameter of not over 2 inches immediately below the cap seat or stopple shall hold the correct capacity when filled to within one-fourth inch of this cap seat or stopple; bottles with an inside diameter of over this amount immediately below the cap seat or stopple shall hold the correct capacity when filled to within one-eighth inch of this cap seat or stopple.

It is recommended that the above material be amended to read as follows:

Milk bottles with an inside diameter of not over 2 inches immediately below the cap seat or stopple when one is provided, or at the top when the closure is effected by an overall cap and no cap seat or stopple is provided, shall hold the correct capacity when filled to within one-fourth inch of this cap seat or stopple or of the top respectively; similar bottles having a diameter of over 2 inches at similar points shall hold the correct capacity when similarly filled to within one-eighth inch of the cap seat or stopple, or of the top, respectively.

The following amendment is also proposed.

TOLERANCES. Amend by adding to the tolerance table the 1- and 2-gallon sizes with tolerances as follows:

Capacity	Table A, tolerance on individual bottle		Table B, tolerance on average capacity		Table C, special tolerance for individual bottles in use			
					In excess		In deficiency	
	dr	cu in.	dr	cu in.	dr	cu in.	dr	cu in.
1 gallon	10	2.3	2.5	0.6	10	2.3	5	1.2
2 gallons	18	4.1	4.5	1.0	18	4.1	9	2.0

Mr. RICHARDS. Mr. Chairman, may I say just a few words. We are in accord with the principle of this specification, but really it

[12] See p. 59 for first portion of this report.

Digitized by Google

isn't going to help us any. We went over this last night, and we have something to submit, a copy of which I have just handed to your reporter.

SECRETARY'S NOTE.—The material referred to was presented over the name of the standardization committee, Glass Container Association. It was stated that it was not possible to comply with the tolerances proposed for the 1-gallon and 2-gallon sizes, and that the following tolerances were necessary:

Sizes	Table A	Table B
1 gallon	12 dr or 1½ oz	3 dr or ⅜ oz.
2 gallon	32 dr or 4 oz	8 dr or 1 oz.

It was requested that the 2½-gallon size be added, with suggested tolerances of 38 drams or 4½ ounces and of 9½ drams or 1³⁄₁₆ ounces in tables A and B above, respectively.

Mr. RICHARDS. I really am compelled to object to the suggestion submitted by your committee. We studied this thing very carefully in principle. We are trying to build up, not to break down. But there are some features that are going to be an impossibility to work on, and that are going to work a hardship on everybody.

We work in cooperation with the sealers. I wrote every State sealer in the United States, and asked everyone to cooperate. We told them everything we are trying to do, but in different States they have different feelings on milk bottles.

Here is the thing which we want. It has been passed by the standardization committee of the Glass Container Association, of which I am chairman. We have filling points specified at the cap seat and at one-eighth inch and at one-quarter inch below the cap seat. What have we got to do? In the event that a bottle is correct when filled to the last-mentioned point, when it is tested by filling it to the cap seat we get no tolerance, although a tolerance is plainly stated. Take another make, correct to the cap seat; when filled to a point one-quarter inch below the seat it becomes a short bottle, and we are under bond not to deliver short-measure bottles. It is hard on us. You know we have got modern filling machines and modern equipment, and we no longer have to fill these bottles one-quarter inch below the cap seat. If we do it leaves an unfilled space.

Concerning the 2-gallon and 1-gallon sizes, you haven't given us the proper tolerance. You realize there is an unavoidable variation in those bottles. I want to say that we have a right to have a 2½-gallon size; you recognize that size for another purpose. These are the reasons why I am now suggesting that we let this thing go over. I am sure the glass industry is not going to offend. We are going to do just what is right. When these specifications are amended we want them right.

Mr. HOLBROOK. Some time ago Mr. Richards wrote me a letter, and described this over-all cap—a cap set on the top of the bottle—and requested information as to where the filling point would be on a bottle made to be used with an over-all cap. I gave it as my interpretation, that since the filling point in a bottle having a cap seat was one-quarter inch below the cap seat, the new bottle might well be measured to a point a similar distance below the new seat, which was the top of the bottle. I suggested that it would be perfectly reason-

Digitized by Google

able to measure the capacity of these bottles and to fill these bottles, to within one-quarter inch of the top. Mr. Richards, as I recall it, replied that this was a very satisfactory solution of the whole matter. Consequently when the committee met, we worked out the proposed specification accordingly. We thought this recommendation was entirely satisfactory to the glass industry.

As I understand Mr. Richards' proposition this morning, he desires to have the customary bottle, having a cap seat, measured to a point one-eighth inch below the cap seat and bottles having a top closure, to a point three-eighths of an inch below the top. Now that is proposed for the first time—the committee has never heard this recommendation before. It represents a distinct departure from the former interpretation which was said to be entirely satisfactory. As to the present requirement that the filling point be one-quarter inch below the cap seat, I might say that some years ago, the National Bureau of Standards made an investigation of the filling of milk bottles in practice. We found that the average bottle of milk or cream was actually filled to a point one-quarter inch below the cap seat.

In view of the glass industry's desires, as stated by Mr. Richards, I will ask permission of the Conference to strike out all these recommendations of the committee, as to milk bottles, which have not as yet been acted upon by the Conference, to give the industry an opportunity to decide what it wants. The requirement of this Conference in relation to the filling point has stood unchanged for 15 years or 20 years. We can hardly reopen the matter this morning to consider this new suggestion of one-eighth inch and three-eighths inch, in the case of bottles having cap seats and bottles designed to use over-all cover caps, respectively.

Mr. LEITHAUSER. I think the recommendation of Mr. Holbrook is very wise. I think it should go over until the milk-bottle manufacturers can present a definite recommendation for the consideration of the Conference.

Mr. RICHARDS. I just want to make one more statement, because I am afraid I didn't make myself clear. What Mr. Holbrook said in relation to the survey about the filling point is absolutely a fact. There is no question about that. We are coming out for one-eighth inch because we think the bottles will be filled more nearly to that point. All the dairy plants are equipped with modern machinery. We are not asking for more tolerance.

The CHAIRMAN. Now, gentlemen, the matter before you is the committee request for authority to strike from its recommendation the paragraphs in relation to milk bottles, which you are now considering.

Mr. O'KEEFE. I move you that Mr. Holbrook's request be concurred in.

(The motion was seconded, the question was taken, and the motion was agreed to.)

RECONSIDERATION OF ADOPTION OF SPECIFICATION 16 FOR LIQUID-MEASURING DEVICES, AS AMENDED [13]

Mr. RAGLAND. Mr. Chairman, I ask for a suspension of the rules, to reconsider our decision in relation to specification 16, for liquid-measuring devices. I hope the gentlemen will agree with me.

[13] See p. 86.

Digitized by Google

The CHAIRMAN. Is there any objection to suspending the regular order of business? If there is no objection, the chair will suspend the regular order of business.

Mr. RAGLAND. I move that the conference proceed to reconsider specification 16 for liquid-measuring devices, as adopted yesterday. It is my idea that the specification be adopted in the form originally recommended by the committee on specifications and tolerances. I ask for this as a matter of fairness. I rose on this floor, and proposed an amendment to you gentlemen and you agreed to it. I found out afterwards that we were doing an injustice to the manufacturers.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. RAGLAND. Now, gentlemen, I desire to withdraw the amendment which I offered to that specification and which was adopted.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. RAGLAND. Now that leaves us in the position of having taken no action on specification 16.

Mr. GRIFFITH. Mr. Chairman, I will ask that the secretary read specification 16 for liquid-measuring devices as originally submitted by the committee on specifications and tolerances.

Mr. HOLBROOK (reading):

16. Return of Indicating Element to Zero.—Retail devices shall be so designed and constructed that the indicating elements used to tally sales and deliveries to individual purchasers or to indicate the amount delivered when any portion of the cycle or stroke has been completed, or the unit price or the total price thereof, shall be returnable readily to a definite and clear zero indication before the next delivery is begun. *Means shall be provided to prevent the indicating element from being returned beyond the zero graduation. The indicating elements may be advanced only by the mechanical operation of the device itself:* Provided, however, That the device may be cleared by advancing the indicating elements but in this event the registration shall be obscured and remain obscured until the zero is reached.

Mr. Harrison called attention to the fact that the words "or the unit price" were included in error, and the committee desires to strike out these words.

Mr. GRIFFITH. Mr. Chairman, I make a motion that specification 16 be adopted as submitted by the committee, with the deletion of the words mentioned.

(The motion was seconded.)

Mr. ROGERS. Mr. Chairman, I want to explain this to our delegates from the State of New Jersey because it may not be clear why we are changing this specification as adopted, and this should be considered carefully at this time. Everybody here desires the reading element of a device to come back to zero before the next delivery can be begun. I want to still sustain myself and my position on that point. However, since yesterday, I have learned a few things about the situation and the effect the amendment offered by Mr. Ragland would have, with particular reference to certain new equipment that has been made and is ready to go on the market. Before some of these companies are able to get this equipment approved by the chiefs of the departments of various jurisdictions, there is a good possibility that these specifications may be applied, and, if so, it would tie up their entire program. We are also confused on a patent

Digitized by Google

situation. I believe, in view of this, that the question on the amendment should go over and the specification adopted as the committee recommend it.

Mr. RAGLAND. I am strongly in favor of having the gallonage, the price per gallon, and the total price, all synchronized together. I believe it is right. I believe we are coming to it. I am not going to give in a single thing. There are certain things that will be developed, and have been developed, that I knew nothing in the world about. The weights and measures men should be taken into the confidence of these men as well as the petroleum institute. I ask for the question on the motion.

(The question was taken, and the motion was agreed to.)

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON MODIFICATION OF SEVERAL CODES—Continued [14]

Mr. HOLBROOK (reading):

LUBRICATING-OIL BOTTLES

Tolerances.—Amend by adding 1-gallon size with tolerance of 20 drams in excess only, to the tolerance table.

(The amendment was duly adopted.)

Mr. Holbrook (reading):

SCALES

General Specifications.—12a. This specification reads as follows: "The graduations on all beams and reading faces shall be clear and distinct *and in no case shall their width be less than 0.008 inch.*"

Amend this specification by adding at the end thereof the following:

"—except as provided in specification 12c—*nor more than the width of the minimum clear interval between graduations. On any bar of a beam, all graduations shall be equal in width. The graduations on beams shall be of such character and arrangement and shall be so numbered that all weight indications may be conveniently read.*"

Mr. BAUCOM. There is just one word in there I don't feel is really all right. The word "conveniently" is a hard word to define, and when we get into court probably there will be some question as to what is "convenient."

Mr. HOLBROOK. I think that the word is a reasonable and proper one. If you can suggest something better, it can be considered.

Mr. LEVITT. Wouldn't the word "accurately" be a much better word than "conveniently"?

Mr. BAUCOM. I move that the word "accurately" be substituted for the word "conveniently" in this specification, and that the recommendation of the committee be adopted.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK (reading):

12b. This specification reads as follows:

"12b. *The clear interval between the graduations on all beams shall not be less than 0.04 inch.*"

Amend this specification by adding at the end thereof the following:

"—except as provided in paragraph 12c. *This interval is to be measured between the adjacent edges of successive graduations representing the smallest subdivision and along the line of travel of the index of the poise. The required interval shall be main-*

[14] See pp. 59 and 99.

Digitized by Google

tained whether or not the graduations are "staggered" or arranged alternately; that is, when the graduations are staggered, the interval shall be construed to be the space from one graduation to the next consecutive graduation, extended, if necessary, to intersect the line of measurement."

(The amendment was duly adopted.)

Mr. HOLBROOK (reading):

AUTOMATIC-INDICATING SCALES

Specifications.—2. This specification reads as follows:

"2. All weight graduations on the dial or reading face shall be clear and distinct and in no case shall their width be less than 0.008 inch *nor more than the width of the clear interval between the graduations. Corresponding graduations shall be equal in width. Main graduations shall not be more than 50 percent wider than subordinate graduations."*

Amend this specification to read as follows:

"2. Weight graduations on the dial or reading face shall be clear and distinct and in no case shall their width be less than 0.008 inch—except as provided in specification 3a—*nor more than the width of the minimum clear interval between the graduations. Corresponding graduations shall be equal in width and main graduations shall not be more than 50 percent wider than subordinate graduations. The graduations shall be of such character and arrangement and shall be so numbered that all weight indications may be conveniently read."*

Mr. HOLBROOK. I make the suggestion that the word "conveniently" be stricken and "accurately" inserted in view of the amendment to the previous specification.

Mr. LEVITT. With that change, I move the adoption.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK (reading):

Add a new specification to read as follows:

"3a. Magnified Indicating Elements.—When in normal usage any indicating elements are necessarily viewed as magnified by means of a lens system, the requirements of specification 2 as to minimum width of graduations and of specification 3 as to minimum clear interval between graduations, shall be that the apparent size of the magnified image of such elements as seen by an observer occupying a normal average position with respect to the scale, shall be equivalent to the apparent size of elements complying with the stated requirements and viewed by the unaided eye from a normal distance."

The above should also appear as follows:

Under the heading "General Specifications" as 12c.

Under the heading "Computing Scales" as 9. Also change number of present 9 to 8.

Under the heading "Spring Scales" as 3a.

Under the heading "Cream-Test and Butterfat-Test Scales" as 2a.

I might make the following explanation in relation to this specification. Many years ago, perhaps in 1913 or 1914, when the original specification in relation to width of graduations and clear interval between graduations was being considered by the committee, consideration was given as to whether any change in requirement should be made in the case of scales equipped with magnifiers. At that time the magnifiers on scales were rather crude affairs. They distorted the image of the chart to the eye of the observer and it was not considered by the committee that the magnification obtained did very much good. Therefore, at that time the committee decided that the actual widths and intervals on the chart should be the governing factor regardless of whether or not the chart was magnified. As you all know, magnifiers on scales have been very materially improved since that time, some 20 years ago. On this account and with the fact in mind that the thing of importance really was the image pre-

Digitized by Google

sented the eye of the observer, the committee reconsidered the whole specification.

Mr. LEVITT. The committee did a lot of detail work on this particular item, and I think no better conclusion could have been reached by the committee. I move the adoption of the specification as read.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK (reading):

Specification 8 reads as follows:

"8. When a weight indicator extends along the entire length of a graduation then all that portion of the indicator which may be brought into coincidence with the graduation shall be the same width throughout."

Amend this specification to read as follows:

"8. *The relation between the widths of the indicator and the graduation with which it coincides shall be as follows: If all graduations are of equal width, the width of the index of the indicator shall be equal to the width of the graduations; if main graduations are wider than subordinate graduations, the width of the index of the indicator shall not exceed the width of the main graduations and shall not be less than the width of the subordinate graduations.* When an indicator extends along the entire length of a graduation, then that portion of the indicator which may be brought into coincidence with the graduation shall be the same width throughout."

It has been pointed out by officials that on some scales the graduations are so wide and the indicators are so narrow, that there is a considerable range through which the indicator may entirely coincide with the graduation; that is, the indicator has considerable travel inside the width of the graduation itself. The proposal, we think, will result in scales which can be more accurately read.

(The specification as proposed by the committee, was duly adopted.)

Mr. HOLBROOK (reading):

The first portion of specification 9 reads as follows:

"9. *The clearance between the index of the indicator and the dial or reading face shall not exceed 0.06 inch in the case of all automatic-indicating scales except spring scales not equipped with a device intended to compensate for changes in the elasticity of the springs due to temperature effects* "

Amend this specification by adding at this point the following words:

"*Or not so designed as to be substantially independent of such changes.*"

Mr. HOLBROOK. Let us say that the amendment of this specification is indicated, because springs have recently come upon the market which are designed to be independent of temperature changes. However, in relation to scales equipped with such springs, it cannot be said that there is any "device" incorporated in the scale to compensate for temperature effects because the spring itself is so designed that no such device is necessary to be attached to the scale to produce the result contemplated by this specification.

It seems obvious that whether or not the spring scale is equipped with a compensating device is unimportant. All such scales which are designed so as to be independent of temperature effects should be in the same category. The words suggested are added in order to bring this about.

(The amendment was duly adopted.)

Mr. HOLBROOK (reading):

Add a specification to be numbered 12 and to read as follows:

"12. On any automatic-indicating scale of a capacity of 30 pounds or less, the capacity of a bar or bars with which the scale may be equipped shall be an integral

Digitized by Google

multiple of the capacity of the dial or reading face. Each bar shall be subdivided throughout or shall be subdivided into notched intervals each equal to the capacity of the dial or reading face, and the value of any turn-over poise provided shall be equal to the capacity of the dial or reading face."

Inasmuch as these bars and turn-over poises are provided largely for the purpose of increasing the capacity of the scale, it seems that they should increase the capacity in increments equal to the capacity of the reading face, so when a poise is advanced into a notch, or when a turn-over poise is operated, the indicator will go back to zero on the reading face, and start over again. Any other design might cause honest mistakes or facilitate the perpetration of fraud, because the customer and the user of the scale would be inclined to believe that the poises on the beam and the turn-over poises operated in the manner described, and be guided accordingly. This requirement is included in Federal Specification for Scales, Weighing, AAA–S–121a. When that specification was being prepared this requirement was circularized to manufacturers, and it seemed to be satisfactory, since no manufacturer entered any objection to the requirement.

(The specification as proposed by the committee, was duly adopted.)

Mr. Holbrook. The next few amendments are made on account of the following considerations.

Some years ago automatic-indicating scales were very largely of the spring type. Consequently when the committee proposed requirements for elements peculiar to automatic-indicating scales those requirements were inserted under the heading "Spring Scales." Since that time there has been a very notable increase in the number and types of automatic-indicating scales on the market, necessitating the adoption of a special code for automatic-indicating scales.

It seems to the committee that now that we have a code for automatic-indicating scales of all kinds, this code is the proper place to assemble requirements relative to dials and reading faces, indicators, methods of test, etc., and it is the proper code to which to refer the reader interested in such requirements. With that in mind we recommend the following amendments:

COUNTER SCALES

Specification 11. Amend as follows:

After the word "heading" strike out the words "'Spring scales' except that the graduations are not required to be equally spaced" and insert in lieu thereof the words, "Automatic-indicating scales".

SPRING SCALES

Specification 20 and computing scales specification 16. Amend as follows:

Change the word "heading" to "headings" and insert after the words "General Specifications" the words "and Automatic-Indicating Scales".

Strike out all specifications which are duplicated by similar specifications in the code of specifications for Automatic-Indicating Scales.

(The amendments were duly adopted).

Mr. Holbrook (reading):

The first paragraph under the heading "Tolerances" reads as follows:

"Except on the special tests described above, the tolerances to be allowed in excess or deficiency on all spring scales equipped with a device intended to compensate for changes in the elasticity of the springs due to temperature effects, shall be the values given in the appropriate column in the tolerance table under the heading 'Counter Scales'."

Digitized by Google

Amend this paragraph by adding the following words after the words "due to temperature effects": "or so designed as to be substantially independent of such changes."

The second paragraph reads as follows:

"Except on the special tests described above, the tolerances to be allowed in excess or deficiency on all spring scales not equipped with a device intended to compensate for changes in the elasticity of the springs due to temperature effects, shall be the values shown in the following table."

Amend this paragraph by adding the following words after the words "due to temperature effects": "or not so designed as to be substantially independent of such changes."

(The amendments were duly adopted.)

RESOLUTION CONFERRING AUTHORITY TO MAKE CERTAIN REVISIONS IN CODES OF SPECIFICATIONS AND TOLERANCES

Mr. HOLBROOK. Mr. Chairman, I propose the following resolution:

Whereas the National Bureau of Standards may find it possible during the coming year to republish Miscellaneous Publication M85 containing all codes of specifications and tolerances of the National Conference on Weights and Measures, for the use of officials; and the codes should thus be in as good form as possible for the convenience of the officials: Therefore be it

Resolved, That the Committee on Specifications and Tolerances be given authority to reword the requirements without changing their meaning and effect, to make any desirable rearrangement and renumbering of paragraphs, and to amend cross references as to applicable codes, in the interest of brevity, good form, avoidance of unnecessary repetition, and satisfactory classification.

You have seen this morning some of the things which are necessary. All cross references should be carefully reviewed, and so forth. You will realize that we have amended our code for vehicle tanks so that we have general specifications, specifications for vehicle tanks used as measures, and specifications for vehicle tanks equipped with meters. We have amended our liquid-measuring device specifications to make them applicable to both retail and wholesale devices. In these cases it can readily be recognized that a renumbering and rearrangement of paragraphs will be necessary to get these things into shape before they are finally published as the acts of the Conference. Also, you will see the advisability of a better classification of specifications in view of the way that these codes have been built up over a very long period of years.

The resolution, I think, is worded very carefully to confer proper authority on the committee to make desirable changes in the codes without altering the effect of any requirements.

(It was moved and seconded that the resolution be adopted, the question was taken, and the motion was agreed to.)

THE BYRD BILL TO CONSOLIDATE FEDERAL STANDARD-CONTAINER LEGISLATION

By L. C. CAREY, *Specialist in Package Standardization, Bureau of Agricultural Economics, United States Department of Agriculture*

Mr. Chairman, ladies and gentlemen, some of you may recall Mr. Spilman's discussion of "Proposed consolidation and amendment of Federal standard-container legislation" at the last national conference on weights and measures held in this city on June 3, 1931. At that time Mr. Spilman discussed in detail the provisions of a tentative draft of a bill which was in the nature of a container code, designed: First, to repeal the Apple Barrel Act which is now obsolete

Digitized by Google

by reason of a later Standard Barrel Act and more recent apple grades; second, to centralize the administration of existing legislation pertaining to containers for fruits and vegetables by transfering the administration of the Barrel Act to the Bureau of Agricultural Economics, which now administers the two Standard Container Acts; and third, to equalize and simplify the provisions of existing laws by making the provisions of the Standard Container Act of 1916, which is an interstate commerce law, conform to those of the Standard Barrel Act and the Standard Container Act of 1928, which are weights and measures laws.

The Byrd bill, S. 1460, and its counterpart, H. R. 8027, now pending in Congress, seek to accomplish those same ends and in addition contemplate the extension of the principle of standardization to certain types of containers not now regulated on a national basis in any way, namely, paper cartons, paper market baskets, drums, and crates and boxes.

Except in minor details and changes in the sizes of the subdivisions of the cranberry barrel, the provisions of the existing standard barrel law and those of the Standard Container Acts of 1916 and 1928 and the standards established thereunder would be reenacted under the Byrd bill. For that reason extended comment on these features is unnecessary. The cranberry barrel sizes would be the ⅛, ¼, and ½ barrel, instead of the ⅓, ½, and ¾ barrel, now provided. But it may be interesting to observe the principles upon which the standardization of cartons, crates, and boxes is contemplated.

Section 6 of the Byrd bill provides that cartons, crates, and boxes for fruits and vegetables shall be of the same units of volume and of the same capacities as those established in this act for hampers, baskets, and barrels. It should be understood that this requirement would apply only to cartons, crates, and boxes which of and by themselves are units of measure, such as the bushel box, ½-bushel box, and so forth. Such containers, as stated, would be required to be of the same units of volume and of the same capacities as those established in the act for hampers, baskets, and barrels. Thus the first six sections of the bill would provide standards of capacity for containers which of and by themselves are units of measure or which determine the quantity of contents sold. These are: Tills, including berry boxes; Climax baskets; hampers; round-stave baskets; splint or market baskets; drums; barrels; and certain cartons, crates, and boxes.

Another important class of containers for fruits and vegetables, chiefly cartons, crates, and boxes, is definitely and for the first time recognized in proposed national legislation. I refer to containers for fruits and vegetables, packed, marked, and sold by net weight or count. Such containers would be given legal status under section 7 of the Byrd bill. This section provides that standards for such containers may be established by the Secretary of Agriculture whenever he shall find that the standard containers established in the act are not adequate to meet the exigencies of commercial, packing, or transportation practices. Any such containers found by the Secretary of Agriculture to be reasonably necessary shall be established by him and the dimensions and capacity prescribed. Every such container shall be clearly marked with the name of the product, the net weight or count, and such further description, according to the commodity, as may be required by the Secretary. Included in this

Digitized by Google

class of containers would be, cantaloup and asparagus crates; celery, cauliflower, cabbage, and lettuce crates; citrus boxes; peach, pear, plum, and prune boxes; apple cartons; cartons for mushrooms, tomatoes, and so forth; and others too numerous to mention.

The Byrd bill, if passed, would result in the standardization of all types of containers used for fruits and vegetables, excepting bags and sacks.

The one other section of the Byrd bill which may be of particular and peculiar interest to weights and measures officials is section 14. In discussing the provisions of this section in 1931 Mr. Spilman said in part: "This is the section which has been devised in an attempt to make it very sure that the provisions of standard-container legislation shall not interfere with State laws or city ordinances respecting the sale of fruits and vegetables by weight. The problem was to write a section which would in no way weaken or nullify the standard-container legislation and which at the same time would in no way nullify or weaken what you gentlemen have accomplished in bringing about sale by weight." The problem sounds very simple, but was not found to be so, and, although the Conference was invited in 1931 to study the problem and make suggestions, no suggestions were ever made so far as I know.

However, while no constructive criticism or suggestion relating to this particular problem has been received from the various States, we have reason to believe that it may be of the utmost importance to weights and measures officials and that some provision along the lines indicated is necessary to prevent confusion and consternation in the administration of State and city regulations affecting the sale of fruits and vegetables. In at least two States the erroneous impression has apparently become wide-spread that the provisions of the Standard Container Act of 1928 abrogate all existing State laws and regulations relating to the method of selling fruits and vegetables. Nothing, of course, could be farther from the truth because the provisions of the act of 1928 apply only in transactions involving the specific types of containers which are regulated by that act, namely, hampers, round stave baskets, and splint baskets.

However, as a means of definitely protecting State and city regulations requiring sale by weight or count, the original section discussed in 1931, as it appears in the Byrd bill, has been amended with that thought in mind. This section now reads as follows:

> Standard till baskets, Climax baskets, hampers, round stave baskets, drums, market baskets, cartons, crates, boxes, or barrels which do comply with the standards established under this act shall not be used by any retailer for the determination of the quantity of fruits or vegetables sold at retail unless such fruits or vegetables were received therein by him or unless such retailer is the producer or grower of the fruits or vegetables so sold. Nothing in this act shall be construed as prohibiting the sale of fruits or vegetables by net weight or numerical count.

As nearly as may be visualized by Messrs. Holbrook and Smith, of the National Bureau of Standards, and by those in our bureau connected with this work, the provisions of this section will amply protect the progress you have made in the direction of reducing retail sales to the two most accurate methods of quantity determination—weight and count.

Whether or not, or when, the Byrd bill will be enacted cannot, of course, be foretold. Strangly enough, when it was introduced in the

Digitized by Google

previous session of Congress, there was scarcely any reaction, either for or against the measure. Similarly, when it was reintroduced in the present session, there was no reaction for or against it until it was reported favorably by the Senate Committee on Agriculture and Forestry. When that happened, opposition, more or less scattered, arose in the Western States. Much of this opposition, as it has been analyzed, is due to misunderstanding and misconstruction of the measure and misapprehension as to its effects. Generally the sentiment in the East and Middle West, as far as we have been able to observe, is favorable to the measure. While the western opposition will probably delay and possibly defeat the measure in the present Congress, it is believed that when the provisions of the bill are understood, such opposition as now obtains will largely disappear.

The CHAIRMAN. Thank you, Mr. Carey.

TESTING EQUIPMENT FOR LARGE-CAPACITY SCALES

The CHAIRMAN. We will now proceed with program item 34, "Testing Equipment for Large-Capacity Scales". Officials are invited to give particulars concerning special equipments for testing large-capacity scales. We were to have had this item last evening, when we would have had a nice discussion accompanied by slides furnished by the Philadelphia department. Unfortunately the meeting could not last a sufficient length of time to permit this. So now I would like to call on Mr. Vanderslice, of Philadelphia, to open this discussion.

PAPER OF JACOB M. VANDERSLICE, DISTRICT SUPERVISOR, BUREAU OF WEIGHTS AND MEASURES, PHILADELPHIA COUNTY, PA.

Mr. Chairman, ladies, and gentlemen, there has recently been purchased by the Philadelphia bureau of weights and measures, a "known-weight" trailer—the first of its kind in Pennsylvania—which now permits legal testing of platform scales up to 30 tons. Prior to 1934 it was impossible for the bureau to make accurate tests of platform scales of even ordinary capacity because its equipment was inadequate. With the testing weights formerly available, the best that could be done was to attempt to check heavy-duty scales with comparatively light test weights. It was recognized, however, that scales may test as accurate at 500 pounds but still be decidedly in error under heavier test loads.

In order to facilitate the legal testing of platform scales, therefore, the bureau purchased a "known-weight" trailer, adjustable up to 10 tons. The use of this device makes it possible to test platform scales from 0 up to 10 tons, including those with capacities up to 30 tons. The shifting of the trailer to various points throughout the city is made comparatively easy by the use of a motor truck capable of moving at a speed of 35 miles per hour. The appearance of this equipment is shown by the accompanying illustrations. (See figs. 8, 9, and 10.)

Ths use of a "known-weight" machine is comparatively new in weights and measures inspection. Outside of Philadelphia nowhere in Pennsylvania is it possible to make legal test of platform scales having even ordinary capacity.

In this same general connection of large-capacity scales, it may be of interest to tell you something of our activities in connection with the trafficking of coal by trucks which has confronted the staff of the

Digitized by Google

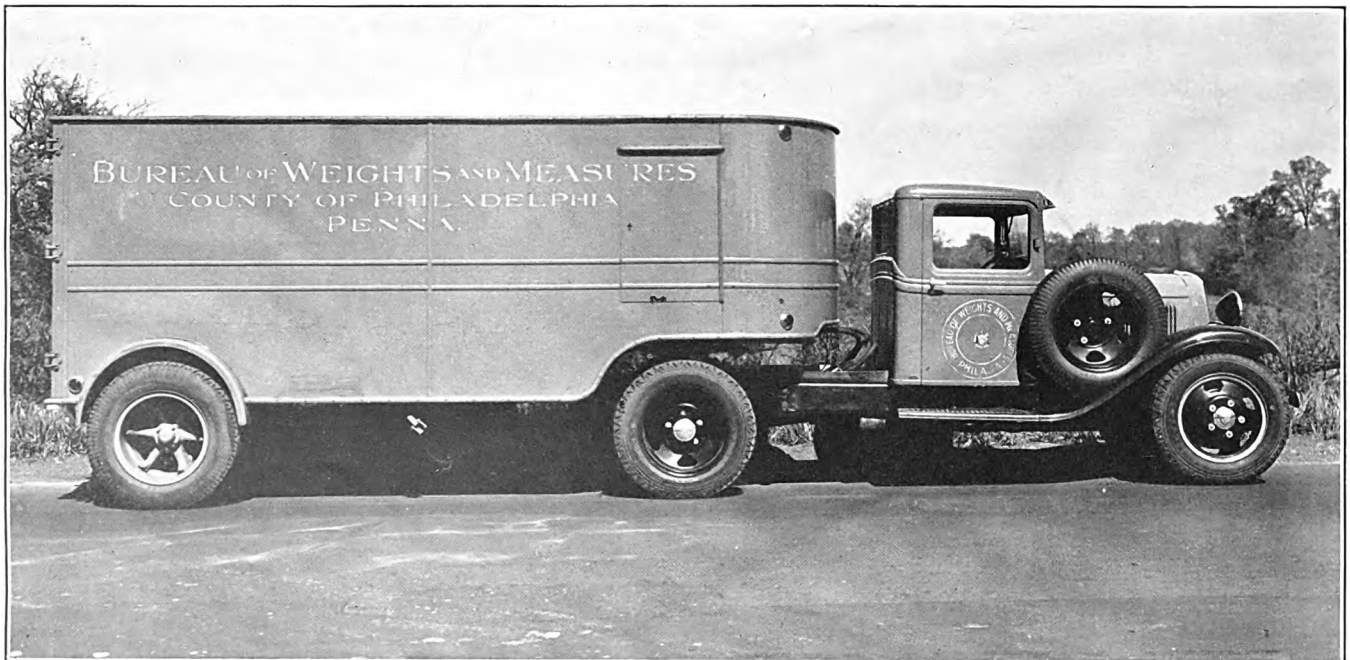


FIGURE 8.—*General view of large-capacity scale-testing equipment of Philadelphia County, Pa.*

Digitized by Google

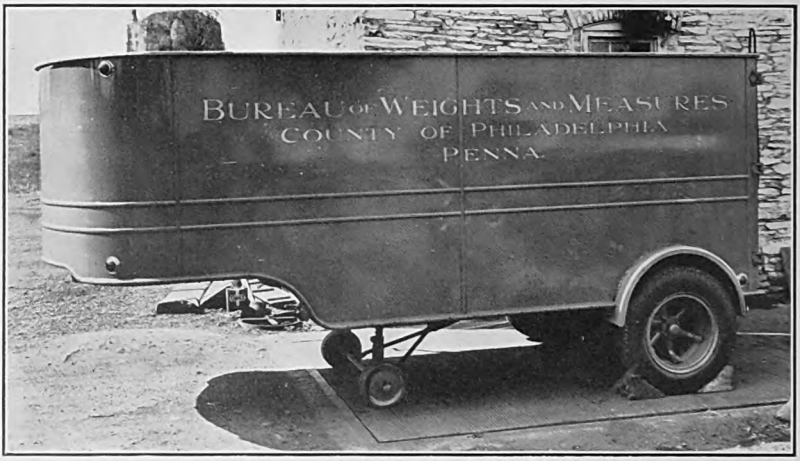


FIGURE 9.—*Known-weight trailer portion of Philadelphia County, Pa., equipment spotted at one end of scale platform.*

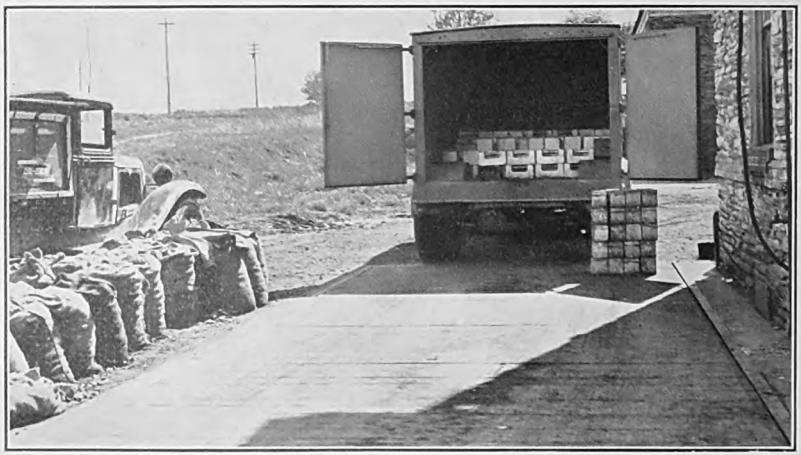


FIGURE 10.—*Making corner test with 50-pound test weights.*
Philadelphia County, Pa., equipment.

Digitized by Google

weights and measures bureau with a serious problem. Both the prevalence of unemployment and the cost of transportation constituted factors which have tended during the past few years to increase at a rapid rate the trucking of coal into Philadelphia from other sections of the State. While the so-called "bootleg coal" presents a many-sided problem, the only phase of the matter that need concern the bureau is whether the citizens of Philadelphia are getting the weight for which they are charged.

From records maintained by the bureau and by the NRA administrator it was estimated at one time that there were 1,747 coal trucks engaged in hauling coal of various kinds into Philadelphia. Many of these deliveries involved short-weighting the public. This practice was frequently coupled with the delivery of coal of inferior quality, so that the prices paid were frequently out of all proportion to value of the coal received.

In order to combat such short-weight practices, the bureau made a survey of trucks hauling coal into Philadelphia. Amazing discrepancies between the amounts of coal sold and the weights actually delivered were uncovered. In some instances, shortages actually exceeded the amount delivered. The minimum shortage encountered in this survey was 73 pounds per 2,000-pound ton, and the maximum shortage 1,348 pounds. In no case where the above coal deliveries were reweighed by the bureau's inspectors was it found that full weight had been delivered. Furthermore, the coal so purchased was found to have cost, on the average, slightly in excess of $13 per ton.

While the bureau's primary function with respect to this traffic, as stated previously, is to ascertain that coal trucks are making full-weight deliveries, the scope of its work was so expanded as to make it instrumental in eliminating certain "coal rackets." The best known instance was the "Mecca case", recently publicized in the local newspapers. It relates to the apprehension and conviction of a former county emergency relief board employee actively engaged in defrauding the unemployed. It was the practice of this party to obtain advance payments on orders for coal, on many of which deliveries were never made. It is gratifying to be able to report that the bureau was instrumental in throwing light on this practice and in reporting the facts of the case to the district attorney.

It is generally recognized that the average small truck cannot carry a profitable load to Philadelphia from mines located in other sections of the State, even when it is overloaded; also that, lacking this overload, it is ruinously expensive to deliver full weight. Thus, the bureau, by merely determining that local truckers are delivering full weight, has been able to contribute effectively toward the gradual elimination of small and irresponsible trucking units.

Although coal weight inspection for this year has only been active since September 1, 1934, the following summary indicates a creditable record for this division:

Coal trucks reweighed	24,197
Violations reported	3,647
Adjusted by Adjustment Board	1,061
Prosecutions	1,121
Prosecutions discharged	239

As a result of these prosecutions, the city was reimbursed to the amount of $13,404 for fines and costs. It is noted that the

Digitized by Google

above statement fails to record the disposition of 1,465 violations, many of which were not prosecuted, these being cases (1) where informants were unable to furnish the names of violators, (2) where the bureau could not obtain cooperation from individuals cheated, or (3) where the violators forfeited their bail posted for nonappearance. In addition to these cases, there were a number of instances where the violators lived or moved out of Philadelphia. Not only does the added expense make further prosecution proceedings inadvisable, but the bureau also believes that a distinct benefit accrues to the public from dropping such prosecutions. Truckers of this type have definitely been driven out of the coal trucking business in Philadelphia, and knowing that such violation cases are pending, it is questionable whether these individuals will attempt further coal deliveries in the city.

In attempting to control the short-weight practices of various "bootleg coal" dealers, the bureau was handicapped by the lack of official scales of sufficient capacity to weigh heavily-loaded trucks. This condition was remedied, however, when city council designated 61 scales, located in various sections throughout Philadelphia as the official devices for checking the weights of coal-truck deliveries. All such scales are subject to frequent tests by the bureau's inspectors.

Under the terms of the coal-trucking ordinance passed in December 1934, all trucks bringing coal into Philadelphia must be weighed at one of the above scales. The owner of the scales on which coal is weighed receives 25 cents per load from the trucker, plus an additional fee of 5 cents for each additional consignment on such load.

Owners of scales in Philadelphia are supplied with standard coal-delivery forms prepared by the bureau. These forms are prepared in triplicate and each indicates the name and address of the dealer, the name and address of consignee, the net weight of the consignment, and the signature of the weighmaster.

The fact that a trucker has had his load weighed at one of the official scales, however, does not mean that the bureau's inspection system is at an end. A check is made on trucks by intercepting them between the weighing scales and their points of delivery, periodic checks of this sort being made in order to make sure that purchasers are receiving full weight. A tolerance of 30 pounds is allowed on each ton and the bureau is glad to be able to report that the prosecutions occurring under the present system are due chiefly to ordinance violations, rather than short-weight deliveries to customers.

Of each 25-cent fee collected by the owners of scales, 10 cents is returned to the city treasurer. The bureau estimates that an income of $25,000 should be received from this source annually—an amount which should go far toward defraying the cost of maintaining the necessary inspection activities in this division.

As the result of thorough enforcement of the coal-trucking ordinance, the unsatisfactory conditions previously existing in the distribution of coal in Philadelphia have largely been eliminated. The coal-trucking business is being satisfactorily regulated, and the public is getting full weight on deliveries.

In contrast to the 1,747 trucks which were found to be delivering "bootleg coal" in Philadelphia during the latter part of 1934, it is estimated that there are only about 250 trucks engaged in this business at the present time. The licensing ordinance passed by city

Digitized by Google

council on December 19, 1934, has been instrumental in this reduction. It is now required that those selling or delivering solid fuel in Philadelphia obtain licenses from the bureau of weights and measures at a cost of $75 for each calendar year. Many irresponsible truckers have discontinued trafficking in coal rather than pay for the required licenses.

The ordinance referred to, however, failed to provide for the small hauler, who trucked from local coal yards and made deliveries to consumers on a credit basis not ordinarily obtainable from the large dealers. To meet this situation an amendment to the ordinance was passed by council on March 8, 1935. The bureau is now allowed to grant permits, costing $1 each, to such small haulers, this being done on the theory that they are not in the coal business, make no profit on the coal, but merely obtain a small hauling fee from customers and, in many cases, extend credit on deliveries. The bureau is also legally authorized to issue additional license plates, at a charge of $1 for each plate, to firms or individuals maintaining more than one truck.

That the city of Philadelphia is assured of a definite source of revenue from this source is shown by the following tabulation, which includes such collections made between February 15 and April 30, 1935.

Licenses, permits, and extra plates issued, and fees collected

Purpose	Number issued	Fees collected
Licenses	710	$53, 250
Permits	73	73
Extra plates	1, 485	1, 485
Total	2, 268	54, 808

It is estimated that the fees collected for extra license plates will defray the cost of manufacturing all such license plates and the record cards, so that the return to the city from licenses will be free from deductions for such expenses. It is believed, moreover, that the net income derived will meet, and possibly exceed, the bureau's costs for handling this work.

The CHAIRMAN. Thank you, Mr. Vanderslice.

THE TESTING OF BEER BARRELS

By WILLARD E. REED, *Superintendent of Weights and Measures, Newark, N. J.*

Mr. Chairman, ladies, and gentlemen, when the Government legalized beer on April 7, 1933, it caught the brewery industry and allied trades unprepared in many ways, but of most importance was the shortage of containers used for the transportation and sale of beer. Three months later, while there was an urgent need for new containers, the situation became less acute and barrels more plentiful. At the beginning, all sorts of beer kegs were put into service, many of these being old barrels that had been in service for years, or were

Digitized by Google

lying idle, and were less than the legal capacity. Steadily, during the 3 months after repeal, new barrels came upon the market, and in the course of another 6 months, new wood appeared in use in all the breweries in the State of New Jersey.

Beer is sold by the unit of 31 gallons to a barrel. This has always been the custom of the trade and is recognized by the Government, also by the State of New Jersey, for taxing purposes. By this method of measurement, the most popular container is the half barrel, or 15½-gallon size. There are many factors which cause this package, supposed to contain 15½ gallons, to shrink to an actual capacity of 13½ gallons. First, many kegs are made of oak. To prevent leakage these are "pitched" inside before being used. Since pitch is a heavy, tarlike substance, the coating on the barrel tends to decrease the capacity. Second, since the barrels are made of wood, each time they are returned to the brewery they are inspected for leaks, and in case there is a loss from this source, they are put through a "driving" machine which forces the hoops tighter to the staves. Continued "driving," according to an authority, tends to make the barrel lose a gallon in capacity, after a year or more of use.

While this shrinkage of the wooden container is known to the trade, it is imperative to stress upon brewery owners that they should purchase beer kegs that are at least 1 quart greater in capacity than the legal requirements of 15½ gallons. In some instances manufacturers are making kegs of 15¾ gallons to allow for pitching.

Since the legalization of beer, and after a period of 13 years inactivity on the part of the trade, new developments have brought about the introduction of a metal container for the distribution of malt beverages. While there is some doubt as to the popularity of a metal container with the brewing industries, it is, no doubt, the best adapted package for holding capacities for continued use, in the eyes of weights and measures officials. Our survey revealed that there were at least 10 manufacturers who were putting out a metal container of various shapes and construction that had 15½ gallons capacity.

While weights and measures officials would favor a 15½-gallon barrel being built 1 quart oversize, it is a matter that must be taken up with the Federal and State Governments since their tax is based upon 31 gallons to the barrel. Brewery officials inform us that the Federal Government frowns upon the use of any barrel that exceeds 31, 15½, or 7¾ gallons, and that on any considerable overage, tax must be paid for the amount of another barrel of the same size. In other words, if a barrel is found to contain 16 gallons, the tax could be levied for an additional $2.50, making $5 in all.

On the other hand, the taxation authorities of Federal and State Governments apparently are indifferent to the use of short-sized barrels, since the tax on the short-measure 13½-gallon barrel is the same as on the 15½-gallon barrel. This would tend to encourage short measurement in the distribution of beer. By the continued use of a barrel that holds 14½ gallons, the brewery will be paying a gallon tax on a commodity that does not exist, the purchasing public will pay for a gallon of a commodity that does not exist, and the Government will collect a tax on a gallon of a commodity that is not there.

Digitized by Google

When it is taken into consideration that there must be thousands of barrels that are short 1 gallon in capacity, the amount of money involved is a considerable item. At this point again, we stress the suggestion that barrels be made oversize. Should a barrel start ½ gallon oversize in capacity or, let us say, 16 gallons, for a certain period of its service, there will be an overcapacity distributed. At another point in the barrel life, the capacity will be nearly correct, and now after many months of service, the barrel will tend to give less than the quantity it is supposed to deliver. This over and under condition being distributed over a long period of time would tend to be more fair for everyone, the producer, consumer, and Government.

Everyone is familiar with the sturdy construction of the beer barrel and from its appearance a long period of service is indicated. The containers are costly and their frequent replacement because of errors in capacity that accumulate during their life, would be rather out of the question. The suggestion involving the oversize new barrel would appear, therefore, to be the most reasonable and fair to all concerned.

In our survey, 13 breweries, located at Camden, Trenton, Elizabeth, Newark, Harrison, Paterson, and Union City, were visited, and beer containers of all sizes and shapes, wood and metal, were tested to capacity. Since this survey additional breweries are now operating, making a total of 18, along with 185 bottling plants.

Barrels made in Europe, and imported from Germany, Great Britain, Switzerland, France, Holland, and Belgium were inspected and tested. While barrels from Poland, Ireland, and Austria were not found in New Jersey breweries, it is known that there are containers, manufactured in these countries, in use in the State.

There are three ways of testing the capacity of a beer barrel.

Probably the simplest, and one that will permit the weights and measures officials to test more barrels, is by the use of the gauge rod and the United States Gaugers' Manual. By this test, the mean diameter of the barrel is determined by subtracting the head diameter from the bung diameter; this difference is then multiplied by 0.63 and the product added to the head diameter, which gives us the mean diameter. The mean diameter is then squared and multiplied by 0.0034, which result is then multiplied by the length of the barrel to obtain the capacity. Inside dimensions are taken in every instance.

The second and more accurate test is known as the volume test. This requires one-half hour to complete. The barrel is filled with water. The spigot is inserted in the bung top and the water is run off into liquid measures. By this test, the capacity of a barrel may be determined down to fluid ounces, as all barrels are sold with liquid content. The test is conducted under the same conditions as exist when the barrel is used.

The third method, which is known as the weight test, was not originally tried, although the department has since made use of this method at times. This test is based upon the weight of water contained in the barrel. Thus, a 15½-gallon keg should contain 128 pounds and 10 ounces of water, on the basis of 8.3 pounds per gallon. Due to varying weights of beer, a test by weighing a keg filled with beer was not used, nor is it suggested to be used. Water is a more constant factor.

It seems reasonable to assume that the quantity of beer in a barrel or keg should be determined on the basis of its volume at the tempera-

Digitized by Google

ture at which it is barreled and dispensed; this temperature is believed to average about 41° F. At this temperature the average weight per gallon of beer is probably close to 8.46 pounds, although individual beers may differ from this by as much as 1 percent either way.

Containers suspected of containing less than the proper amount of beer (on the basis of 31 gallons to the barrel) may be weighed and marked for identification before being tapped; after having been emptied they may again be weighed and their original contents in gallons arrived at by utilizing the figure above for the average weight per gallon. This result should be fairly accurate. For more precise determination, the weight per gallon of the particular beer in question could be individually determined and used instead of the average value.

With particular reference to quantity determination the Federal authorities have adopted more modern methods, namely, the use of meters, whereby the tax is determined on the basis of what the meters actually show in gallons.

There was a further angle to the container situation that was not generally understood by the manufacturers of beer barrels, and that is, there is a law in New Jersey that requires the maker of any weighing or measuring device to submit to the State department of weights and measures for approval such equipment as is intended for use here in the determination of quantity.

Beer containers come within the scope of this law, and we require that each manufacturer shall submit samples of his barrels to the State superintendent of weights and measures for inspection and test before their distribution in this State is attempted. We have contacted all manufacturers coming under our notice and have advised them of our requirements should they have occasion to sell their barrels to brewers in our State. Some have already submitted their containers and received approval, others are following. Without State approval beer containers will have no legal standing. The law that governs this serves a very worthy purpose and will tend to prevent short-measure barrels from getting into use. We enforce this law to the letter. Brewers have been advised to demand of salesmen or manufacturers a certificate of approval from our department before making purchases of beer containers.

Inquiry has been made as to whether it is necessary to place a label bearing a statement of the quantity of the contents upon kegs and barrels containing beer, ale, or porter, in view of the fact that the revenue stamp upon such kegs and barrels states the quantity.

The Federal Food and Drugs Act, as amended, requires marking with a plain and conspicuous statement of the quantity of the contents and the regulations (F. I. D. 154) require all statements of the quantity of liquids to be in terms of the United States gallon and its usual subdivisions. In the opinion of the bureau the statement of quantity placed upon the revenue stamp is not a marking sufficient to comply with these requirements.

In conjunction with this law the State superintendent has also set up certain tolerances and regulations covering beer barrels. All beer barrels or kegs shall be marked, stamped, or branded in a permanent manner with the name and location of the brewer or brewers using such barrels or kegs.

State authorities and brewers differ somewhat on tolerances to be allowed in excess or deficiency in all barrels or kegs used for the distribution of beer, ale, or porter.

Digitized by Google

The tolerances to be allowed in excess and in deficiency in all barrels or kegs used for the distribution of malt beverages shall be the values given in the following table; provided, however, that the manufacturers' tolerances for new barrels or kegs shall be one-half of the values given. The word "manufacturers" as used in this section shall apply to the makers of such barrels or kegs.

WOODEN BARRELS AND KEGS

Capacity	Tolerance	
	In excess	In deficiency
Barrel (31 gal)	3 quarts	1 quart.
Half barrel (15½ gal)	2 quarts	1 pint.
Quarter barrel (7¾ gal)	1 quart	½ pint.
Eighth barrel (3⅞ gal)	1 pint	1 gill.

STEEL BARRELS

Barrel (31 gal)	2 quarts	1 quart.
Half barrel (15½ gal)	1 quart	1 pint.
Quarter barrel (7¾ gal)	1 pint	½ pint.
Eighth barrel (3⅞ gal)	½ pint	1 gill.

In view of this difference regarding tolerances on beer containers, our State superintendent, Mr. Berg, has been in conference with the brewers in New Jersey in order that the brewers and weights and measures officials may arrive at a definite decision regarding a fair tolerance.

I might say, at this time, that our reception at the various breweries visited was cordial and every facility for testing was placed at our command, even to the extent of interrupting the routine of their work.

The CHAIRMAN. Thank you, Mr. Reed.

DISCUSSION OF ABOVE PAPER

Mr. FITZPATRICK. I am not a member of the Conference, but after Mr. Reed's talk, I wonder if I might call attention to a matter which came to me when I was assistant administrator of the Brewers' Code Authority of the United States.

One thing that we are a little bit fearful of is the excess proposed to be allowed by the excellent paper you have just heard. At the present time I merely wish to call your attention to the fact that no Federal ruling of the alcoholic tax unit of the Bureau of Internal Revenue has as yet been made.

There is a 31-gallon barrel required for tax purposes, and then there is a 31½-gallon barrel specified by some State laws. I call to your attention that the contents of this container is not definitely decided on and there is very, very considerable difficulty in getting a standard. Individual standards set up by the various departments will not solve the matter. The departments in the various States should cooperate to find whether a barrel is going to be 31 or 31½ gallons in size. Then the Bureau of Standards should be consulted so as to get a definite measure. Everybody from the producer to the consumer is interested to have a barrel of liquid contain

Digitized by Google

a certain standard capacity and to get the proper amount distributed.

I wish to recommend to you gentlemen that it might be well for you to consider this matter very carefully.

Mr. EMHARDT. In regard to Mr. Reed's paper, and the conditions we have in Philadelphia, I wish to point out from a practical standpoint that this question of beer is quite a sore spot in Philadelphia. We have a new measuring device made by one of our companies, and we have discussed this matter with Mr. Reed, and have gotten some very fine information from him.

The beer barrels that are being supplied Philadelphia by the brewers are running about 5 gallons short. There are considerable shortages in the half barrels and the quarter barrels, also. So we are in a very bad situation today, as you can see. We get some of our beers from outside of Philadelphia—from Allentown and Reading, as well as other places. We try to enforce our regulations strictly at the present time.

I might say that I don't know just what apparatus the brewers in Philadelphia use for testing the capacity of containers. I know that old kegs are common and it is entirely right for them to use them, but we find them short, too. We have yet to find any of the kegs that are very short, in beer from outside of Philadelphia. Perhaps the practical thing for the men here to do is to remove the beer to see that the proper amount of beer is in the container.

Mr. WALDMAN. I am particularly interested in this beer-barrel-testing proposition, because of a case I had a year or more ago. I had received numerous complaints that the retailers weren't getting the amount, or the number of glasses, out of a barrel advertised in a pamphlet issued by a brewery in St. Louis, so I decided to make a few tests on their barrels. I did not have an experience like Mr. Reed. On the contrary, I met with a great deal of opposition. I wasn't permitted on the premises until I threatened arrest. Now that is a fact.

After I got in the plant I was confronted with another situation. The brewers' union threatened to pull every man out of the plant if I touched a barrel. I had to overcome that situation before I got results. Then I began to make tests, and I found they had two-third barrels which were short in excess of tolerances. I think the same condition prevails in most of the breweries. I think this barrel question needs some real worthy study.

Mr. STILES. There are one or two points that do not seem to me to be entirely clear. You speak of barrels coming from the manufacturers, but it is not a finished product when it comes from the manufacturer, is it? I believe a barrel should be a uniform product. Of course, they have to drive the hoops on to keep them tight, but the practice should be such that delivery can come from the brewery in full amount. It is highly essential that a tolerance in excess be allowed on these barrels if you are going to have full capacity when the breweries actually fill them.

There is another problem in practically all the States. The law provided for 31½ gallons for a barrel. It is difficult to set up a tolerance in accordance with the law, and have it apply on all liquids, when actually your beer barrel contains only 31 gallons. I don't know how you are going to overcome this difficulty in most States. In our State we changed the law to provide that the beer barrel should

Digitized by Google

have a capacity of 31 gallons, primarily to make it conform to the Federal tax law, which apparently set up this standard in opposition to all State laws as to the capacity of barrels. I do hope that if we arrive at 31-gallon standard, we will make a reasonable tolerance, actually enforcible and operative in the same manner as for other containers.

Mr. REED. Some time ago taverns in New Jersey commenced to advertise the 16-ounce glass of beer. Only those in the community, or the neighborhood in which this tavern was located, knew there was a 16-ounce glass sold, due to the fact that the advertising did not come to the attention of the stranger. In the event the customer doesn't ask for a 16-ounce glass, he will not get it. It is a sort of "come-on" as we call it up in Jersey. We haven't found any real difficulty, but they do not really give it to every customer that comes in there; as I said, those living in the neighborhood know of it; others coming in will get a smaller glass, 8 ounces or even 6 ounces. In our investigations that is what we have found.

Now in regard to sham glasses, there is where we actually found shortages, and this is what we do. We go to these taverns and purchase two glasses and bring them out to make the test. If they do not hold the required capacity, the seller is in trouble. But, after all you nearly always find 6-ounce and the 8-ounce glasses all right. In any event the man who is dispensing the beer is not actually at fault because he bought the glasses in good faith.

THE WEIGHTS AND MEASURES PROVISIONS OF THE COPELAND BILL TO REVISE THE FEDERAL FOOD AND DRUGS ACT

By W. S. FRISBIE, *Chief, Division of State Cooperation, Food and Drug Administration, United States Department of Agriculture*

Mr. Chairman and gentlemen, the title of this paper is to a slight degree misleading since the Copeland bill which passed the Senate on May 28 contains, strictly speaking, no provisions referring to weights and measures as such, nor does it standardize any food or drug or cosmetic in terms of weight or measure. Associated with weights and measures laws, however, are those provisions which require a declaration of the quantity of contents in the case of food in package form. That section in the Copeland bill which refers to the quantity of contents is, with one exception, the same as the proviso in the present law which was passed in 1906. The exception to which I refer is the word "accurate." In other words, the bill declares a food to be misbranded if it is in package form and fails to bear a label containing an accurate statement of the quantity of contents in terms of weight, measure, or numerical count. A proviso is added permitting reasonable variations and exemptions as to small packages, these variations and exemptions to be prescribed in regulations by the Secretary of Agriculture. At the present time, certain variations are recognized by regulations of a general, rather than a specific, character. In other words, no specific tolerance is set up for the various articles of food. The exemptions are more specific in that one-half avoirdupois ounce, or less, of food is considered small and no net weight statement required. A package containing 1 fluid ounce or less of food is small and similarly exempted from net weight labeling. It is obviously inopportune to undertake any forecast as to the

Digitized by Google

nature of regulations to be adopted if and when this measure becomes a law, although it is important to note that the bill as at present drawn authorizes the Secretary of Agriculture, as soon as the bill is passed, to conduct hearings and formulate regulations which shall become effective on and after the date when the law goes into effect. It is worthy to note that the injunctions regarding the declaration of quantity of contents are applicable under the terms of this bill to drugs and to cosmetics which are in package form. At the present time, of course, there is no Federal act regulating the composition or labeling of cosmetics and in the case of drugs net weight statements are not required.

Another section of the Copeland bill declares an article of food to be misbranded if its container is so made or filled as to mislead the purchaser. This, of course, is the essence of the so-called "slack-fill" bill which has appeared in one form or another before Congress for a number of years, the first one having been introduced by Mr. Haugen, who was chairman of the House Committee on Agriculture, on September 2, 1919. This bill passed the House in December 1920, and was referred to the Senate Committee on Agriculture and Forestry, but did not pass the Senate. In subsequent sessions of Congress, similar bills were introduced by Mr. Haugen, the last having been introduced in the first session of the Seventy-second Congress. Some of these bills passed the House, but in no instance both the House and the Senate. At the Seventy-third session of Congress, the slack-fill and deceptive container provision was incorporated in the bill S. 1944, frequently referred to as the Tugwell bill, amending the Federal Food and Drugs Act. The intent of the provision is obvious since the purchaser naturally regards the size of the package as an index of its contents. It has been contended frequently by those opposed to such legislation that the purchaser has ample information with an accurate statement of the quantity of contents, but this is not necessarily so, since the great variation in density of solid foods affords the average purchaser but little conception as to the meaning of a quarter ounce, half ounce or an ounce in terms of bulk. This is particularly true in the case of spices which were conspicuous examples of slack-filling at the time of the World War and immediately following. That the practice has not entirely been abandoned is evidenced by the collection of samples in the year 1935.

So far as interstate commerce is concerned, the enforcement of this proviso does not represent entirely a virgin field of endeavor for there has been for 4 years a slack-fill requirement in the act by virtue of the McNary-Mapes amendment, so far as canned fruits and vegetables are concerned. The authority conferred on the Secretary of Agriculture by this amendment is extended in the Copeland bill in the section which authorizes the establishment by the Department of definitions and standards for food. This section of the bill authorizes the Secretary to promulgate regulations fixing not only a definition and standard of identity but a reasonable standard of quality, including the fill of container. Exempted from the standard of quality, however, are fresh fruits and fresh vegetables. A proviso in this section directs the Secretary to give due consideration to the natural shrinkage in storage and in transit of fresh, natural food and to the necessity for suitable packing and protective material. Progress, of course, has already been made under the existing amendment. As you are

Digitized by Google

probably aware, standards for some fruits and vegetables, including fill of container, have been adopted.

State legislation, however, has preceded Federal, so far as slack-fill food is concerned, since at least three of our Commonwealths have on their statute books provisions of this sort.

It appears that Nebraska was the first State to legislate on the subject of slack-fill of package food. An amendment to the food law which has been in force for nearly 15 years declares food in package form to be misbranded regardless of any statement as to quantity of contents if the package itself is not filled with the food it purports to contain. This was followed shortly by legislation in North Dakota and in Alabama, both of which adopted a similar amendment to the existing food law. In none of these States, however, is there any injunction regarding the use of deceptive containers. Accurate figures are not available as to the extent to which the practice of slack-filling has been corrected by the adoption of these amendments. So far as any corrective effect from a Nation-wide standpoint, this appears to be negligible, but this is not surprising in view of the magnitude of the commerce in food, both interstate and intrastate, exclusive of these three States, entirely without regulation so far as interstate shipments and intrastate sales are concerned. State officials are to be commended, however, for their aggressiveness in undertaking to correct this practice so far as their individual laws are concerned. A conspicuous example is afforded by the recent activities in Alabama. The department of agriculture and industries, which enforces the Alabama food law, has recently collected a number of samples of food products which show a degree of slack-filling for which apparently no valid reason can be offered on the basis of commercial practice. For example, six samples of black pepper showed a fill of container from 82 percent to as low as 43 percent, coffee and chicory compound 67 to 80 percent, the average about 70 percent, and one sample of tea revealed a 53 percent fill of container. A package of fancy sealed pecans in an attractive basket with a false bottom bearing the net weight label on the bottom of the package was only 77 percent filled. It may be contended by the manufacturers that space must be allowed in a carton of salt to permit easy removal of the contents, but it would seem that 28 percent of head space would be more than ample for this purpose. Three samples of salt collected showed a fill of 72, 75, and 80 percent, respectively. Slack-filling appears even to have invaded the field of drugs for Alabama reports epsom salt in package form with a 66 percent fill of container. Regardless of the claim of the manufacturer or packer that he is giving his customers their money's worth in all instances, slack-fill packages are inherently deceptive and should be forbidden both by State and Federal laws.

To the members of this conference a deceptive container is a familiar figure. The fancy candy box which apparently would hold a pound or a pound and a half actually, but contains 14 ounces, the bottle with a gigantic dimple in the bottom, and other devices, are too well known to need any extended comment. It is a matter of history that the various slack-fill bills considered by Congress were opposed, particularly with regard to the deceptive-container provision, by the manufacturers of glass bottles. They stated their apprehension that such legislation would eliminate the heavy shouldered bottle which

Digitized by Google

they deemed essential for shipments to avoid unnecessary breakage. No law, whether State of Federal, can be enforced if it is unreasonable, impractical, or in any way capricious in its terms. The language of the Copeland bill refers to containers of food which are made or formed in a manner to mislead the purchaser. An extract bottle with heavy shoulders to withstand breakage need not in addition be made with a thick bottom, deep panels, and elongated neck; no one can truthfully assert that such a bottle is not deceptively formed. There are many other examples of deceptive containers as evidenced by recent purchases made by the food and drug administration. Here, again, the argument may be advanced that if the quantity of contents are accurately stated there is no cheat on the consumer; this may be true but at least he is deceived and disappointed and should not be forced to give critical examination to casual or everyday purchases in order to avoid deception. Sponsors of the Copeland bill believe that the incorporation of this particular provision will be decidedly in the interest of the consumer without being oppressive to the manufacturer of food containers.

The CHAIRMAN. Thank you, Mr. Frisbie.

THE ANNUAL ASSAY COMMISSION

By H. W. BEARCE, *National Bureau of Standards*

Mr. Chairman, members of the Conference, ladies, and gentlemen, the Annual Assay Commission meets at the United States Mint in Philadelphia on the second Wednesday in February of each year to examine and test the fineness and weight of the gold and silver coins reserved by the several mints for that purpose from the coins minted during the preceding calendar year.

In order that you may have in mind certain of the important basic facts relating to our coinage, and particularly those relating to the functions and procedure of the Annual Assay Commission, I shall refer to or quote from the laws and regulations relating thereto, and from the rules adopted by the Assay Commission in 1930. The section references are to the United States Code, title 31, chapter 8.

Section 315 sets out the denominations and weights of gold coins in detail, but I presume that these provisions have been repealed by the steps taken to revalue and nationalize gold, referred to later in this paper.

Sec. 316. Silver Coins; Weight.—The silver coins of the United States shall be a dollar; a half-dollar, or fifty-cent piece; a quarter-dollar, or twenty-five-cent piece; and a dime, or ten-cent piece. The weight of the dollar shall be four hundred and twelve and one-half grains troy of standard silver, the weight of the half-dollar shall be one hundred and ninety-two and nine-tenths grains; the quarter-dollar and the dimes shall be, respectively, one-half and one-fifth of the weight of said half-dollar.

Sec. 349. Deviations Allowed in Adjusting Weights; Silver Coins.—In adjusting the weight of the silver coins the following deviations shall not be exceeded in any single piece: In the dollar, the half and quarter dollar, and in the dime, one and one-half grains.

In order to indicate the accuracy formerly required to be obtained in the weight of gold coins, I will also quote section 348 relating to this subject although it is, naturally, of no practical consequence at this time since gold coins are no longer being minted.

Digitized by Google

Sec. 348. Deviations Allowed in Adjusting Weights; Gold Coins.—In adjusting the weights of the gold coins, the following deviations shall not be exceeded in any single piece: In the double-eagle and the eagle, one-half of a grain; in the half-eagle and the quarter-eagle, one-fourth of a grain. And in weighing a number of pieces together, when delivered by the superintendent of coining department to the superintendent, and by the superintendent to the depositor, the deviation from the standard weight shall not exceed one-hundredth of an ounce in $5,000 in double-eagles, eagles, half-eagles, or quarter-eagles.

By the terms of sections 321 and 346, standards for fineness of gold and silver coins are set up.

Sec. 352. Sealing and Transmitting Trial Pieces.—At every delivery of coins made by the superintendent of coining department to a superintendent, it shall be the duty of such superintendent, in the presence of the assayer, to take indiscriminately a certain number of pieces of each variety for the annual trial of coins, the number for gold coins being not less than one piece for each 1,000 pieces or any fractional part of 1,000 pieces delivered; and for silver coins one piece for each 2,000 pieces or any fractional part of 2,000 pieces delivered. The pieces so taken shall be carefully sealed up in an envelope, properly labeled, stating the date of the delivery, the number and denomination of the pieces inclosed, and the amount of the delivery from which they were taken. These sealed parcels containing the reserved pieces shall be deposited in a pyx, designated for the purpose at each mint, which shall be kept under the joint care of the superintendent and assayer, and be so secured that neither can have access to its contents without the presence of the other, and the reserved pieces in their sealed envelopes from the coinage of each mint shall be transmitted quarterly to the mint at Philadelphia. * * *

Sec. 363. Assay Commissioners.—To secure a due conformity in the gold and silver coins to their respective standards of fineness and weight, the judge of the District Court for the Eastern District of Pennsylvania, the Comptroller of the Currency, the assayer of the assay office at New York, and such other persons as the President shall, from time to time, designate, shall meet as assay commissioners, at the mint in Philadelphia, to examine and test, in the presence of the Director of the Mint, the fineness and weight of the coins reserved by the several mints for this purpose, on the second Wednesday in February, annually, * * *. If it appears by such examination and test that these coins do not differ from the standard fineness and weight by a greater quantity than is allowed by law, the trial shall be considered and reported as satisfactory. If, however, any greater deviation from the legal standard or weight appears, this fact shall be certified to the President; and if, on a view of the circumstances of the case, he shall so decide, the officers implicated in the error shall be thenceforward disqualified from holding their respective offices.

RULES ADOPTED BY ASSAY COMMISSION IN 1930 FOR ORGANIZATION AND GOVERNMENT OF THE COMMISSION

The first five rules have to do with the formal organization of the Commission, and the delivery of the reserved coins to them.

VI.—The chairman will then arrange the members of the board in three committees—one to take charge of counting, one of the weighing, and the other of the assaying, with power to associate members interchangeably and to require the manipulatory aid of the officers of the mint.

VII. *Of the Counting.*—The committee on counting shall receive from the superintendent of the mint at Philadelphia the packages containing the pieces reserved by the several mints for the trial of coins in accordance with section 3539 of the Revised Statutes. These packages shall be compared by the committee with the transcripts furnished with them and shall be properly verified. The committee shall select packages from each mint for each month's coinage and containing all denominations coined, and accurately count the coins therein. The committee on counting shall deliver to the committee on assaying and to the committee on weighing such of the reserved coins as those committees may choose for their examination.

VIII. *Of the Assaying.*—(a) The committee on assaying shall receive the several parcels of reserved coins from the committee on counting.

(b) They shall select parcels representing each month's coinage of each mint and containing all denominations coined; from each of the parcels chosen they

Digitized by Google

shall remove therefrom such a number of coins of the different denominations as will in their best judgment be sufficient for individual test assays.

(c) From such other parcels as they may judge to be sufficient for the purpose they shall remove one or more coins to be melted together and cast into an ingot of convenient size, from which samples shall be taken for test assays. * * *

IX. *Of the Weighing.*—(a) The committee on weighing shall receive from the committee on assaying the residues of the several parcels of reserved coins, and shall take at random from the parcels of each mint such a number of coins of each of the denominations represented and so distributed by dates of coinage as will in its best judgment be sufficient for the purposes of weighing.

(b) The pieces taken shall be severally weighed by the committee on weighing or under the scrutiny thereof, and their respective weights ascertained to an accuracy of not less than 0.01 grain and the results shall be noted with a special reference as to any that may be found without the legal limits of weight.

(c) The committee shall examine the standard weights employed in the mint and shall satisfy itself that they are satisfactory as to accuracy in accordance with the standards prescribed by law in section 3549 of the Revised Statutes.

X.—The weighings and assayings having been completed under the scrutiny of the committees, respectively, the committees will report, fully and specifically, as to the coins of each mint.

XI.—And thereupon the commissioners will proceed to declare their judgment by an open vote; and a full record thereof, and of all their doings, having been engrossed by the secretary, it will be signed by all the members and delivered to the Director of the Mint, after which the board will be adjourned sine die.

The foregoing rules are subject to such modifications or alterations as a majority of the board may at any time during each annual assay deem expedient and proper.

ADOPTED BY THE ASSAY COMMISSION OF 1898

The committee (on weighing) recommends that the standard weights which are kept specifically for the use of the Assay Commission, and which are retained in possession of the Director of the Mint, be sent in December of each year by him to the Director of the Bureau of Standards, who shall have them compared with the legal standard and who shall forward them each year, under seal, to the commission with a certification of their accuracy.

Some years ago it was customary for the President to appoint a rather liberal number of persons to the Assay Commission, a small number of whom performed the active duties of the Commission. In recent years the number has been so reduced that practically every member must take an active part in the work of one of the three committees.

One member of the Commission is usually appointed from the staff of the National Bureau of Standards, and it has become the custom for this member to serve as chairman of the committee on weighing.

The members of the Commission assemble at the Philadelphia Mint at about 10 o'clock on the morning of the second Wednesday in February. They are greeted by the Director of the Mint, the superintendent, and other officials, and shortly thereafter the Commission meets and organizes for carrying out its work. The Commission elects a chairman and secretary, and the chairman of the Commission then appoints a chairman for each of the three committees, (1) On counting, (2) on assaying, and (3) on weighing, and assigns the remaining members to the several committees as seems most appropriate. The chairman of each committee is usually an expert in the work to be performed by his committee.

After the Commission has been organized, as above outlined, a recess is usually taken and the Commission conducted through the mint on a tour of inspection after which luncheon is served. Immediately after luncheon the Commission reassembles, by committees, and begins the active work of counting, weighing, and assaying the

Digitized by Google

coins selected from those reserved for that purpose, representative samples being taken from each shipment.

The actual work of the committees usually occupies the afternoon of the first day, and either the morning or morning and afternoon of the second day, the time required depending upon the effectiveness of the committees and the number of coins to be examined.

It may be thought that the work of the Annual Assay Commission is perfunctory, a mere matter of form. Such, however, is by no means the case. Each committee does its work with extreme care and thoroughness, and when each mint gets a clean bill of health, as they usually do, it may be taken as good evidence that the coinage for the preceding year has actually been held within the limits of weight and fineness provided by law.

The seriousness of the situation, should any coins be found to be outside the legal limits of weight or fineness, can be seen by reference to section 363 quoted above. I know of only one instance in which serious errors were found. In that case the officer responsible was actually disqualified and removed from office.

In view of the number and value of the coins minted each year by each of the several mints the record of accuracy is remarkable and greatly to the credit of the organization—the Director of the Mint, the superintendents of the several mints, and all who participate in this important work.

The annual report of the Director of the Mint is a most interesting and informative document. From this we can learn not only the value and number of coins minted during any year, but also the total value and number of coins of all kinds and all denominations since the beginning of our coinage in 1793.

For example, we learn from this publication that $50 gold pieces were minted only in 1915; that double eagles, or $20 gold pieces, were minted in every year except 1917, 1918, and 1919, from 1850 to 1932; that eagles, or $10 gold pieces, were minted from 1793 to 1804, and from 1838 to 1933, with a few exceptions between 1917 and 1931; that half eagles, or $5 gold pieces, were minted in every year except 1816 and 1817 from 1793 to 1916, and since 1916 only in 1929 and 1933; that $3 gold pieces were coined only between 1854 and 1889; that quarter eagles or $2.50 gold pieces were coined between 1796 and 1929, with several years missing; that standard gold dollars were coined every year from 1849 to 1889; and that since 1889 the only gold dollars coined have been special memorial or commemorative coins minted in 1902, 1903, 1904, 1905, 1915, 1916, 1917, and 1922.

Similar detailed information is given for silver coins and for the various minor coins of nickel, copper, and bronze. You may learn, for example, that in 1922 there were minted no 5-cent pieces, and fewer bronze 1-cent pieces than in any other year since 1878. This information may not be important to you unless you happen to be a collector of coins. It would, however, indicate, for example, that a half-cent piece minted in 1831, a 1-cent piece minted in 1877, or a 2-cent piece minted in 1878 would, because of its relative scarcity, probably be worth more than its face value.

Information as to the number and value of the coins turned out by all the mints over a period of several years may be of interest. In the 10-year period ending with 1933, the total number of pieces was 2,131,323,124, having a value of $1,086,490,433.50.

Digitized by Google

The Assay Commission does not test the minor coins, i. e., 5-cent and 1-cent pieces, nor does it test the coins minted for foreign countries, of which during the year ended June 30, 1934, there were 10,540,000 silver pieces and 8,500,000 nickel pieces, or a total of 19,040,000 pieces coined for foreign countries. These were all coined at the Philadelphia Mint and were for Colombia, Cuba, Ecuador, and Honduras.

Since January 31, 1934, there has, of course, been no gold coined in the United States. It seems probable, however, that you still have an interest in the theoretical gold dollar and the relation it bears to the former standard of value. I shall therefore mention it briefly.

The following is quoted from the report of the Director of the Mint for the year 1934, under the heading "Gold Revaluation and Nationalization."

Supplementing the President's order of April 20, 1933, prohibiting gold hoarding and establishing Government control of the export of gold, an Executive order was issued under date of August 29, 1933, providing that gold produced from domestic mines might be sold abroad at world market prices. Under this order the United States mints and assay offices received, on consignment, the newly produced gold, supported by affidavits evidencing eligibility, and delivered gold for sale. The average sale price under this order was $30.99+ per fine ounce, as compared with the price theretofore in effect of $20.67+ per fine ounce, the coining value of an ounce of pure gold.

Executive order of October 25 authorized acquisition by the Reconstruction Finance Corporation of newly mined domestic gold received on consignment by United States mints and assay offices. Gold was received under this order at the official prices fixed from day to day, ranging upward from $31.36 to $34.06, averaging to January 15, 1934, approximately $33.58 per fine ounce. Executive order of January 15, 1934, and regulations issued thereunder authorized purchase by the New York Federal Reserve bank of gold received on consignment by the mints and assay offices, at prices fixed from day to day by the Secretary of the Treasury. Under this order the price was fixed at $34.45 per fine ounce, and remained thereat until the President formally revalued the United States gold dollar by proclamation of January 31, 1934, under the act of May 12, 1933, as amended by the Gold Reserve Act of 1934. This proclamation declared the gold dollar to be 15$\frac{5}{21}$ grains of gold nine-tenths fine, which is equivalent to $35 per fine ounce. Thereafter the United States mints and assay offices resumed the purchase of proffered eligible gold, at the price of $35 per fine ounce.

On this basis the new dollar is theoretically worth 59.06 cents in terms of the old dollar, or the old dollar is worth about $1.69 in terms of the new. That, of course, does not necessarily mean that it now takes $1.69 to buy what $1 would buy before the revaluation.

The nature and arrangement of the report of the Annual Assay Commission can best be shown by the use of excerpts from an actual report. For that purpose I shall make use of the report of 1931, covering the calendar year 1930. The following material is quoted from that report, special attention being given to the report of the weighing since that is the phase which, I think, will be of the greatest interest.

The work of the committees having been completed at 11:20 a. m., the Commission was called to order by the presiding officer, and the reports of the various committees as submitted by their respective chairmen were accepted as satisfactory. * * *

COMMITTEE ON ASSAYING

The committee on assaying has completed the test assays on individual coins and mass melts representing the different denominations coined by the mints at San Francisco and Philadelphia, no gold or silver having been coined during the year at the mint in Denver.

Digitized by Google

No half eagles were made during the year, and the only gold coinage was executed at the mint in San Francisco.

According to the following table, showing the extreme variations found on individual coins and mass melts tested under the supervision of the committee, the 1930 coinage of the several mints has been found safely within the legal allowance prescribed by law, which is one one-thousandth fineness for gold and three one-thousandths for silver coins.

Highest assays on gold coins: San Francisco	899. 9
Lowest assays on gold coins: San Francisco	899. 6
Highest assays on silver coins:	
Philadelphia	900. 2
San Francisco	901. 1
Lowest assays on silver coins:	
Philadelphia	898. 6
San Francisco	898. 4
Mass melts:	
San Francisco (gold)	899. 7
Philadelphia (silver)	899. 5
San Francisco (silver)	899. 1

COMMITTEE ON WEIGHING

The committee on weighing reports that in accordance with the rules adopted by the Assay Commission in 1930 the committee received from the committee on assaying the residues of the several parcels of reserved coins, and took therefrom at random from the parcels of each mint such a number of coins of each of the denominations represented and so distributed by dates of coinage as to be sufficient for the purposes of weighing. It was found possible to select one or more coins from substantially every one of the 103 parcels presented. The above procedure resulted in the selection of 295 pieces.

Each of these coins was weighed to an accuracy of 0.01 grain and the results recorded. The standards used were a set of sealed coin weights and a set of grain weights, delivered to the Commission from the Bureau of Standards, Washington, D. C., under seal and accompanied by certificates signed by the Director of the Bureau. The weighings were made by the method of substitution on the balance belonging to the Philadelphia Mint regularly employed for this purpose. This balance was tested before the weighing of the coins was commenced and was found to be accurate and reliable and very well adapted for the work of the committee.

The weight of each coin is given in the table below. An examination of these results will demonstrate that each coin was well within the deviation allowed by law. Also the average weights of the coins of the several denominations were very close to the standards similarly established.

The deviations from standard of the heaviest and lightest coins encountered, of each denomination from each mint, are shown in the following table:

Coins	Legal deviation allowed	Philadelphia		San Francisco		Denver	
		Heavy	Light	Heavy	Light	Heavy	Light
Gold:	*Grains*	*Grains*	*Grains*	*Grains*	*Grains*	*Grains*	*Grains*
Double eagle	0.5	----------	----------	0.15	0.02	----------	----------
Eagle	.5	----------	----------	.30	.21	----------	----------
Silver:							
Quarter dollar	1.5	1.15	1.11	1.09	1.03	----------	----------
Dime	1.5	.44	.48	.53	.85	----------	----------

After the weighing of the coins reported above, your committee tested the weight known as the "Troy pound of the mint", a weight of great importance not only because it is the primary standard of the Philadelphia Mint, but also because of its long and interesting history. The standard used in comparison was a Troy pound weight known as "B. S. Troy pound 63" furnished by the Bureau of Standards for this purpose and accompanied by a certificate giving its correction. Several observations were made both by reversing the weights on the pans of the balance and by substitution. Unfortunately the balance upon which

Digitized by Google

the weighing was necessarily conducted was not very well adapted to a test such as this. It was a balance of relatively large capacity and consequently not a very sensitive one; neither did it repeat its indications with precision. Therefore the value of the weight under test could not be obtained with the precision which the committee would have desired to attain. The error of the weight was so small as to be less than the probable error of the final result. It can be confidently said, however, that the weight is correct within an accuracy of +0.02 grain.

In connection with the above comparison combinations of weights of the set used as working standards of the Philadelphia Mint were tested and it was indicated that these were of satisfactory accuracy. * * *

Upon the completion of the reading and acceptance of the committee reports, Mr. Shields suggested that the thanks of the Commission be extended to the mint officials and employees for their courtesy and assistance during the sessions of the Commission, and also to the chairman for his very able direction of the work, all of which met with the hearty approval of the members. * * *

(Signed) WALTER T. TAGGART, *Chairman*,
O. B. DICKINSON,
A. R. JOHNSTON,
WILLIAM S. WALKER,
WILLIAM A. ASHBROOK,
F. S. HOLBROOK,
B. G. SHIELDS,
THOMAS A. WRIGHT.

On completion of the work of the Commission, it is customary for each member to be presented with a commemorative bronze medal. I have here an example of such a medal, which I am sure you will be interested in examining. It is that of the late President Coolidge. The latest medal (1935) is in honor of President Roosevelt. In each case the medal is in honor of the President who is in office at the time of meeting of the Commission.

The CHAIRMAN. Thank you, Mr. Bearce.

REPORT OF COMMITTEE ON NOMINATIONS, AND ELECTION OF OFFICERS

The CHAIRMAN. Is the committee on nominations ready to report?

Mr. HOLBROOK. The report has been laid on my desk.

The CHAIRMAN. The report will be read by the secretary of the Conference, instead of by the committee.

Mr. HOLBROOK (reading):

Your committee on nominations presents the following list of names for officers and members of the executive committee for the ensuing term—

Officers: Lyman J. Briggs, president; John P. McBride, first vice president; C. D. Baucom, second vice president; Martin L. Lang, third vice president; J. C. Tinkey, fourth vice president; F. S. Holbrook, secretary; George F. Austin, Jr., treasurer.

Members of the executive committee: Seth L. Lightfoot, Howard E. Crawford, S. H. Wilson, John J. Levitt, Rollin E. Meek, S. T. Griffith, George S. Barnard, Louis G. Waldman, Walter G. White, John S. Burke, C. J. Reynolds, C. R. McFadden, Urban E. Dice, B. W. Ragland, H. N. Davis, and George Warner.

(Signed) J. C. TINKEY, *Chairman*,
H. N. DAVIS,
JOHN S. BURKE,
HOWARD E. CRAWFORD,
ROLLIN E. MEEK,
Committee on Nominations.

Mr. HOLBROOK. In view of the nomination of Mr. McBride, I will assume the chair for a moment. Are there any further nominations?

(It was moved and seconded that the nominations be closed, and that the secretary be directed to cast the ballot of the Conference for the officers and mem-

Digitized by Google

bers of the executive committee, as nominated, the question was taken, and the motion was agreed to.)

(Accordingly, the secretary cast the ballot of the Conference for the officers and members of the executive committee, as nominated by the committee on nominations, and they were declared duly elected.)

(Mr. McBride resumed the chair.)

The CHAIRMAN. You very deeply honored me when you selected me as temporary presiding officer of the 1935 Conference. I was a little nonplussed when my name was presented as first vice president and in doubt as to whether I should continue. I am also a member of the committee on specifications and tolerances, and I do not intend to be a "secretary of everything." I think probably I have acted properly in standing for nomination as vice president, as it will allow me to continue for the ensuing year. Incidentally since I arrived, it is the first position I have received that has any indication of a point of rest. And that is the hope in the position. I thank you very much.

I think, gentlemen, that I will take advantage of being a vice president, and will ask Mr. Baucom to assume the chair.

(At this point, Mr. Baucom assumed the chair.)

THE CONTROL OF "BOOTLEG" COAL

By S. T. GRIFFITH, *Chief, Division of Weights and Measures, Baltimore, Md.*

Mr. Chairman, and ladies and gentlemen, probably one of the most unusual developments during the economic depression, particularly to departments of weights and measures in the Middle Atlantic States adjacent to or near the anthracite coal region, and especially to the coal industry in general, is a new method of mining and disposing of coal, which, for want of a better name, has been termed "bootlegging coal." This name is not quite the proper one to apply, because, as we generally understand the term "bootleg" it connotes the dealing in an unlawful product, and coal, we know, is not an unlawful commodity. However, the method of handling this product is so closely allied to the term that it is commonly used throughout the trade, for in most instances the coal is illegally mined or "taken" and disposed of in a manner not altogether in accord with existing laws; hence, the term, "bootleg" coal.

Let us consider this subject from three different angles, which when taken together will, perhaps, present a fairly comprehensive recapitulation of the most important factors: First, the mining or the obtaining of the coal, and the distribution and transportation of same; second, the method of disposing of the coal, and the effect upon the business of retailing coal; and third, the methods employed by departments of weights and measures and other Government agencies to control the proper delivery of accurate weight of the coal, and observance of existing coal laws.

In the first instance, we find that the source of nearly all of this bootleg coal is in the Pennsylvania anthracite coal region, comprising that territory extending approximately from Susquehanna County and Lackawanna County in the northeast to Dauphin County and Lebanon County in the southwest, an area of between 500 and 600 square miles.

34678—36——10

Digitized by Google

Ever since anyone in the Pennsylvania mining regions can remember, miners and their families have been in the habit of going to the culm dumps surrounding their homes to pick coal from among the rock and slate thrown out by the big collieries in the cleaning process. Practically all of the coal companies permitted this, and the "pickings", as a rule, were used for fuel in the miners' homes. Sometimes it was used to pay church dues or a grocery bill, but no one ever sold the coal for cash.

In the last decade the equipment installed and used by the big collieries has become so efficient that many of the miners were deprived of work, and not only that, but little, if any, coal was thrown upon the culm dumps. This, you can see, produced a most interesting socio-economic condition. In a little while, miners began to dig for coal in nearby hills, usually at night and in the woods, to conceal their activities, in places where coal was known to be near the surface. Some then began to sell coal to their neighbors for cash or in exchange for food and merchandise.

Some town and county welfare boards have even met relief requests for fuel by suggesting that the nearby hills were full of coal. This resulted in complaints by some of the coal companies who caused arrests in a number of instances. The welfare board, however promptly secured the release of the bootleggers if it could be proven they had dug the coal for personal use. In most cases, the word of the bootlegger was all that was necessary to satisfy members of the welfare board, usually neighbors, and for reasons of their own, more or less antagonistic to the coal companies.

The local courts also were not inclined to punish these bootleggers. Further, the collieries were apprized that any drastic action preventing or hampering the jobless miners from digging in these holes would probably result in higher taxes in order to provide for more relief.

From a recent article in "The Nation" it is learned that only in a few places—Shamokin in Northumberland County for one—are the bootleggers tapping big veins of coal which the coal companies would eventually mine themselves.

In 1931 and 1932 this bootleg coal hardly ever was sold beyond a dozen miles from the place where the bootleggers had dug it, and probably amounted to not more than three or four hundred thousand tons in all. Today, the article mentioned states, there are about 5,000 holes or tiny coal mines that are bootleg operated every day in the week, except Sunday, occupying the time of more than 15,000 men and boys. Between four and five thousand trucks, with two and sometimes three men on each, are transporting this coal to consumers in the Middle Atlantic States daily.

From apparently reliable reports gathered from Government agencies and civic organizations, it is safe to estimate that approximately 100,000 men, women and children are now directly dependent for a living on bootleg coal. In 1934, so great had the "bootleg" coal business grown that there were illegally mined and "taken" from the anthracite coal region from four to five million tons of coal, amounting in money value to from $35,000,000 to $40,000,000. This brings bootleg coal into the class of big business; only no one engaged in it makes big money. It has been stated that these bootleggers and truckers do not make more than $2.50 average per day. The millions of dollars encompassed in this bootleg industry is spread out very

Digitized by Google

thin, and is distributed in the mining regions to the stores, restaurants, movies, drinking places, gas stations, banks, etc. You can readily see, therefore, that almost everyone in the territory affected is naturally very much in favor of bootleg coal.

In most cases the coal companies and collieries do not object so much to the coal being "stolen" as to the same being transported and sold so successfully throughout the Middle Atlantic States, New York, New Jersey, Pennsylvania, Maryland, Delaware, in Washington, D. C., and in Virginia and West Virginia.

Public sentiment, however, is against the collieries and they can do little about it at the source. They have tried it. In Northumberland County last December, one of the largest coal companies endeavored to begin operations in an area where several thousand unemployed miners were ekeing out an existence. The bootleggers immediately blew up the steam shovel, and up to the present no arrests have been made. Private policemen employed by the Philadelphia & Reading Coal & Iron Co., dynamited over a thousand holes in a few months, but in that time, so "The Nation" says, at least 4,000 new ones were started on the same properties.

During the same period, the same company caused the arrests of nearly 100 bootleggers, but without avail. No jury in any anthracite county is apparently willing to convict anyone for "taking" or trucking coal. The Governor of the State has been requested to take action, but refused, telling the coal companies the men must have work. In the past few months, groups of bootleggers in a few instances have been making terms with the collieries, mostly to independent mine owners, and are beginning to pay a small royalty on every ton of coal they take. Few radicals are found among the bootleggers, who are generally anticommunists, and this perhaps accounts for the lack of serious outbreaks throughout the anthracite coal regions.

Not only the unemployed miners are now engaged in this traffic, but owners of trucks from nearby States are hooked up with them just to do the hauling. It is estimated that not more than half the trucks engaged in transporting coal carry Pennsylvania tags.

The second point involves the method of disposing of "bootleg" coal, and the effect upon the business of retailing coal—and in this connection, may I refer to the conditions in Baltimore City, with which I am personally familiar.

Sometime in 1933 there began to appear on the streets of Baltimore in the outskirts of the city, automobile trucks of 5-ton capacity, loaded with anthracite coal of various sizes transported from Pennsylvania, and which our inspectors of weights and measures reported were being delivered direct to the residences of purchasers. No doubt this condition also prevailed in other cities and towns within hauling distance from the coal mines, usually within 150 miles.

Upon inquiry, it was found that the householder claimed to have purchased direct from the mines the entire truckload of coal, and little attention was therefore paid to the delivery of same by the department of weights and measures. Soon thereafter, however, in the fall of 1933 and the beginning of 1934, these bootleg coal trucks became much more numerous until finally, as far as we could ascertain, as many as 400 truckloads of coal were being disposed of per week.

Digitized by Google

It is reported by the Baltimore Coal Exchange from their investigations that over a quarter million net tons of bootleg coal were disposed of in the city during 1934. This coal was at first peddled or sold direct by the trucker to the consumer, but now this method has been augmented by itinerant "coal brokers"—persons acting as agents for the truckers. Regular trips from the mining region have now been established by the bootlegger, so that when the truck arrives in Baltimore, deliveries are made on orders already secured. In every instance the sale of this coal is for spot cash, whereas the local coal merchant usually extends credit.

These so-called "coal brokers" usually have no place of business, but operated from their home. This coal is offered at a price much less than that possible by the established coal dealer, and averages from 75 cents to $1 over and above the f. o. b. mine price. Such competition is fast annihilating the local coal merchant, who, with his investment—yards, etc.—and taxes to Federal, State, and local governments, together with freight rates and salaries, cannot stay in business at the prices offered by the bootlegger, who has nothing practically at stake, is not entirely responsible, pays no taxes to anyone, except perhaps for the license tag on the truck, and is without facilities for accurate-weight delivery.

This same condition must be affecting in like manner the business of established coal dealers in every community reached by the trucks of the bootleggers. These established coal merchants are fighting with their backs to the wall, struggling for their commercial lives, and with no real hope of adequate relief in sight. The railroads and transportation companies have also contributed to the complexity of the problem. Freight rates are comparatively the same as they were 10 years ago, and much more costly than trucking direct to the consumer's door. These transportation interests, although losing heavily each year in freight revenue, have practically stood on the side lines "holding their hands." Only this last month have they taken any action by putting in a reduced freight rate good until October, and this offers only partial relief.

For the past 2 years, it has been conservatively estimated that between 5 and 10 percent of all anthracite coal sold in the United States has been bootleg, and the price has been from 25 to 50 percent less than that charged by established or regular coal merchants. This is not only serious, but ruinous, competition.

The third point involves the methods employed by departments of weights and measures and other Government agencies in the control of "bootleg" coal, the proper delivery of accurate weight, and observance of existing coal laws.

Departments of weights and measures have been overwhelmed with the problem of meeting the growth of this new business, and even today ways and means of supervising and controlling the distribution of bootleg coal has not been entirely and satisfactorily solved. One reason for this is the factor of interstate commerce and, according to several adjudicated cases, highest courts have held that local laws cannot be enacted in restraint of this phase of trade.

Probably the best laws so far enacted and being prepared are found in the Commonwealth of Pennsylvania, where the movement of bootleg coal is strictly intrastate. There they have enacted and are about to pass laws which will enable the department of weights

Digitized by Google

and measures to more thoroughly control the handling of bootleg coal. Competent weighmasters are licensed for a fee of $5 covering a period of not more than 3 years, and every truckload of coal must be weighed on scales selected and approved by the weighmaster, who then furnishes official delivery tickets made out as prescribed by the statute. This applies to all deliveries of more than 100 pounds, but does not apply to boat or carload lots. The act is very comprehensive and should afford due protection for the citizens who purchase this coal.

In order to further the better control of the disposition of coal by truckers, Pennsylvania has also introduced, if they have not already passed, an act requiring the registration with their public service commission, of all trucks engaged in the hauling of coal, and no truck will be allowed to operate without a permit granted by this commission. Other States, too, have similar statutes affecting coal, but the problem is to enforce equally and impartially with the "bootlegger" and the regular coal merchants.

In Baltimore two ordinances were introduced in the city council looking to this control, both of which, however, were withdrawn when declared by the city solicitor to be in violation and a restriction upon interstate commerce. This left the solution of the problem to the department of weights and measures, with nothing other than the statutes requiring full weight and measure upon the sale and delivery of commodities, and covering the sizes of specified legal measures. A very unsatisfactory handling of the coal-trading situation has ensued.

With the small force of inspectors of weights and measures already fully occupied with regular weights and measures inspection work, it was necessary to ask the aid of the police department, and several plain-clothes officers and an automobile were assigned to this work. All together some progress was made, which, though not entirely satisfactory, was very encouraging. Deliveries of bootleg coal were checked and weighed on sealed scales approximate to the point of delivery, and many convictions were secured for short weight, as the bootleggers were endeavoring to determine the amount of a ton of coal by using bushel fruit baskets. This very unreliable method practically left them guessing as to the accuracy of the delivery intended.

In other States, New Jersey as one example, the authority of appointing honorary superintendents of weights and measures has been invoked with some success. As mentioned before, these truckers sell this coal considerably cheaper than local dealers. Consumers who buy from them save money, and courts and juries frequently look to the main question in cases of this kind rather than to the statutory charge upon which a defendant is being tried, and the main question is whether or not he is intentionally and deliberately cheating the public. It must be admitted that the bootlegger saves money for the consumers. We have, therefore, learned not to expect to get very far in the prosecution of these cases.

Our local courts are inclined to be very lenient in cases involving first offenses. We can report, however, that over $5,000 has been collected in fines for short weight and the possession and use of measures of illegal size, the peak number of convictions being 47 in one week during August 1934. The fines ranged from $2.45 to not more than $100 in each case.

Digitized by Google

It is understood that nearly all of the departments of weights and measures in the several States in which the distribution of bootleg coal is being made, are making better progress in the control of this unusual business.

It would appear that this bootleg-coal problem is here to stay for some time. Independent mine owners are now getting into the picture. Having been denied or unable to establish affiliations with the large coal companies and being thus prevented from securing railroad facilities, they are turning to the truckers.

Whether the improvement of general business conditions and the return to their usual employment will eliminate the bootlegger and trucker remains to be seen. The problem of the control of "bootleg" coal is with us and must be satisfactorily met. Certainly no one is in favor of driving anyone out of business, and sides cannot be taken by any department of weights and measures with either the bootlegger or the established coal dealer. We must and will accomplish control by impartially performing our duties as sealers or inspectors of weights and measures, but insisting that the same laws and equitable conditions be met by both.

The ACTING CHAIRMAN. Thank you, Mr. Griffith.

SIDE BEAMS, HIDDEN WEIGHTS, AND DIAL SCALES

By J. C. TINKEY, *Deputy State Sealer, State of Ohio*

Mr. Chairman, ladies, and gentlemen of the Conference, by invitation of the National Conference a paper was prepared by the writer upon the subject "Side-Beam and Hidden-Weight Scales", which was read on June 6, 1930. Perhaps some in this audience have read it in the Conference report.

From 1912 to 1923, while a county sealer in Ohio, I was many times amused and chagrined to see the customers in a busy store "crane" their necks, trying to see the weight of the purchase that they were about to part with some of their hard-earned money in buying. We resolved, then and there, that sometime there should be a correction made, so that the purchasers could see, and readily see, the amount they were buying, but we realized that not much could be done about it in one county alone. After the transfer to State work there were so many things to be done, especially in cleaning up the gasoline-pump situation, that the opportunity to take action in this matter did not present itself until the year 1929.

We discovered sufficient law and specifications to back us up in demanding a change of construction and installation, and on September 20, 1929, a circular letter was mailed to all pump, oil, scale, grocery companies, and sealers, calling their attention to certain laws and specifications. This brought forth the interest anticipated and on September 10, 1930, circular letter 6 was issued and has been the means of bringing wonderful results. No doubt many of you have read this circular as it has been widely distributed. It has answered its purpose, but in time, we have found that it could be improved upon, just like everything else can be, and have made a few necessary changes.

Hon. Earl H. Hanefeld, director of agriculture and State sealer, of Ohio, and Mr. W. D. Leech, chief of the division of foods and dairies, by whom the weights and measures work is supervised, in the revision

Digitized by Google

of this particular circular 6, which will hereafter be known as regulation 11, saw the wisdom of having this important matter controlled by special regulation, and the wording as now adopted in our book 11, we believe, will meet every purpose for which it is intended and make its enforcement more efficient.

Some of the defects to be corrected are the use of scales that are not properly constructed, installed, or marked with the capacity, and with dials, pointers, side beams or added weights that are not in plain view of the customer, and therefore, in violation of section 7965–1, general specifications 2 and 24, and counter-scale specifications 8 and 10. All new scales shall comply with these specifications and with the following regulation:

(1) All counter and computing scales shall be set upon a solid foundation. Suspension scales shall be hung from a strong permanent support. The reading of all scales used to weigh in the presence of the customer shall be within 3 feet of the customer, or so placed that the weighing element can be easily and accurately read from the natural position of the customer. Suspension or counter scales, with dials, shall have two dials and be glass covered, except when scale is permanently placed where only one side can be read, then one dial is sufficient.

(2) Old scales used for weighing in the presence of the customer, that have hidden "side beams", "poises", or "weights" shall be placed in a clear, readable position to the weigher and the customer, or securely fasten or remove from use, the "poise" or "weight." Scales setting or hanging crosswise of the counter are not permitted, unless on the end of the counter, and then only if the weigher and customer can easily and accurately read the indication of the scale.

(3) Have the dealers place their scales in such a position that the purchaser can see the indications on the scale. View with suspicion any scale which is so placed that the purchaser cannot see the indications of the weighing, also view with suspicion any scale which has the weights continually kept upon it or where heavy paper is placed upon the scale pan.

Circular 6 was mailed to scale manufacturers, dealers and sealers, also to sealers of other States and cities, and I will quote a few excerpts taken from the replies of 3 scale companies, 6 State officials, and 2 city sealers, which will give you the average trend of thought of some 40 or 50 replies received.

1. We do not state 3 feet, but I think it is a good idea. The customer should easily read the computing scale, or in fact any type of scale, and if the hanging type, it should not be hung too high or too low; it should be hung in line with the customer's eye. We in a general way carry out your circular 6.

2. In our opinion, it would be a good thing for the general public if the matters that you mention were put into effect and carried out, because it is necessary that every safeguard possible be given to the general public and to put forth effort to establish these rules. It is unlikely that they would be adopted by this State unless they were adopted and approved by the National Bureau of Standards, and in such case, this State would adopt them automatically. We would be glad to join you in an effort to have them adopted.

3. I think I can safely state that we can support the Ohio Department in all essentials of its regulation governing this type of scale. We shall give your circular further consideration and perhaps will make some recommendations on this subject to our State conference which will meet in September.

4. There are a number of cases where scales are used in a temporary location, for instance, in the sale of fruits and vegetables or on sale days, and it seems to me that there would be considerable difficulty encountered in enforcing the provision requiring that the scale be set upon a solid counter. It seems to me further, that the term "solid counter" is rather indefinite. Suppose that the counter itself is solid but the floor that the counter rests upon is unstable. Would not that cause the same condition as an unstable counter? Your phrase "should have two dials and be glass covered": there are cases where the scale is suspended against the wall or with its back near the wall where the dealer and customer usually occupy about the same position and there would be no object in that case of changing the position of the scale nor would it accomplish anything for

Digitized by Google

the customer by having two dials on the scale in that position. We, clearly, under the law of this State, have the authority to make regulations regarding the construction of the scales themselves, but it is doubtful if we can regulate the placing of the scales in certain specified positions in the stores.

5. We took action last year to cover this matter and have found it to work out very well—a penalty of $25 for the violation of this ruling. You are not alone in taking action along this line and the move you have taken is certainly one in the right direction. I feel that other States will see the wisdom of adopting regulations of a similar nature, regardless of whether or not the National Conference take any action or make any recommendation in the matter.

6. We have always required just the items proposed in your circular and that scales be so placed that the customer is able to read the dial the same as the dealer. I assure you that I am in hearty accord with the proposal and it should be adopted by the National Conference.

7. I have read with much interest your circular 6 and we agree entirely with your requirements 1 and 2. These have been adopted here and we find that both the store owner and the customer are more satisfied. In regards to your item 3, requiring 2 dials and be glass covered, I wish to say, not in the nature of criticism, that this department does not intend to ever make such a ruling, because there are no reasons for it. Suspension scales are not allowed to be hung up with a wire, rope, or chain. An arm, at the end of which is a hook, is permanently attached to the wall or to the display shelves. The scale is so placed at the end of the arm that the dial does not move sufficiently to hinder the reading by the store owner or the customer.

8. It is contemplated by this office to enforce such regulations within the next year and we are glad to see Ohio taking this step also. It is regretted that further discussion was not had at the recent National Conference when the subject was brought up, but due to the lateness of the appearance on the program, no doubt it will be given further consideration by each individual sealer in his own jurisdiction, and finally culminate in definite regulations at the next Conference. It is the opinion of the writer that your proposed regulation will be a step forward in the improvement in the use of this type of weighing device, and result in mutual benefit to both the merchant and the customer.

9. We have always believed that regulations of this kind would serve the public and manufacturer better if issued by the National Conference, but it seems no action was taken on your recommendations. We have always thought, and do now, that the sealers of weights and measures in all States prepare the necessary regulations for the protection of the purchaser, and in so doing we have always found the regulations to be fair, and have met them by making our product to meet their requirements. We think the manufacturer should have no part in preparing any of the plans or regulations that are used by the sealer's departments. Every manufacturer today is endeavoring to perfect a weighing device and many recommendations of benefit to the manufacturers have come from the sealers throughout the country. We believe we should not offer any suggestions to you or attempt in any way to help regulate the procedures of the sealers of weights and measures. When such regulations are promulgated, it is our duty to provide machines that will meet such requirements, and we hope to do so in every case.

10. We are disposed to support cordially and earnestly all State regulations which require instruments of the most accurate construction reasonably possible for weighing and measuring. It will be our pleasure to comply with the proposed new circular 6, although frankly we do not recognize the necessity of the requirement in suspension scales of double dials or of glass-covered dials. Nevertheless, we have always manufactured scales complying with these requirements, so are in position to supply them.

11. Personally, I think any law should either be enforced to the letter or repealed and your department's idea of taking this matter up at this time is most commendable. I believe and hope that all of the scales we manufacture now conform to this law, however, I am enclosing a circular and will greatly appreciate it if you will let me have your advice regarding this and your comments should our present construction be in any way objectionable. Again assuring you that we are very anxious to cooperate in the good you are doing and anticipating your further comments with much interest.

We have not found it difficult to enforce the regulation. The scale companies were instructed as to what was required, both as to the new and old equipment, and agreed to cooperate with the sealers of Ohio, who were also properly instructed through our sealers' meetings held

Digitized by Google

at various places and through them the dealers were informed of the requirements. Occasionally a scale salesman in his eagerness to make a sale would sell a package-weighing scale for counter use, without informing the dealer as to its limits, only to find out later, when the sealer refused to seal the scale, that he had created a condition which was embarrassing to all parties concerned and reflected back on the scale company, and which could have been avoided had regulation 1 been complied with. This reads as follows: "When the manufacturers place with the dealers only those devices which comply with the State specifications, and dealers use only those that are allowed in the manner designated, and replace obsolete equipment as soon as possible with equipment that does comply, conditions would be much better and everyone more nearly satisfied. The sealers receive their instructions from the State sealer, and are, we believe, fair to all and willing to do everything in their power to render service. We desire your cooperation in the adjustment of those matters to the end that the sealer, dealer, and consumer may each have a square deal."

In attempting the enforcement of any new regulation, or, as in this case, enforcing an old one, there are always a few people who stretch their imagination and at once begin to criticize and spread the news, saying, "There they go again, going to condemn and destroy all of our old equipment and compel us to buy new" and get themselves all "het up" over the matter even before they know what it is all about. I have often wondered about it. You never have to even hint that a person should have a new automobile, he just has to have it to be in style and keep ahead of his neighbors and have something "good" and right up to date. How I wish this were the policy in weighing and measuring devices.

You will particularly notice in this regulation that we did not have in mind the entire elimination of this type of scale. To change a long-established custom and eliminate weighing and measuring devices, when in proper order to do correct weighing and measuring, is not the right thing to do; for very often the fault is not in the device itself but rather in the method of operation and its use or misuse, as, for example, a scale could be within 3 feet of the customer and meet every specification and still be entirely hidden from his view, by having piles of merchandise between the scale and the customer. This is one of our "worries" today and a constant source of annoyance, and the question is "Just what can be done about it?" Our mind is open about these matters, and we would certainly like to hear from others.

The quickest and best method of stopping the practice of piling goods in front of the scales is to educate the customers (if such a thing is possible) to exercise their rights by demanding that they be permitted to at least have the opportunity of seeing the weighing. Section 7965–1 empowers us to condemn weights and measures when found to be false or fraudulent, and we contend that when a device is not in the view of the customer it can be so used. Specification 24 states that a weighing or measuring device shall be so constructed as not to facilitate the perpetration of fraud; and, again, a hidden beam or weight can be so used. Specification 8 states that the setting of invisible weights shall be plainly indicated on the customer's side of the scale, and we understand that a beam is a weight.

The above specifications are good, but not quite sufficient to entirely handle the matter, and some States do not have a law similar to our

Digitized by Google

section 7965–1. With our specification 11, first paragraph, added to the above, we have a workable regulation. We recommend that this Conference adopt specifications and regulations such as Ohio has adopted.

(While Mr. Tinkey was speaking, Mr. McBride resumed the chair.)

The CHAIRMAN. Thank you, Mr. Tinkey.

DISCUSSION OF ABOVE PAPER

Mr. BORTELL. Must a scale have a double dial if it is placed permanently against the wall?

Mr. TINKEY. Not if it is permanently against the wall.

Mr. BORTELL. Suppose about 3 months later it be moved to a new position.

Mr. TINKEY. That is where the burden is on the sealer, for when he finds it has been moved from its former place, then, of course, it may come under condemnation proceedings.

UNDERCOVER BUYING AS AN AID TO LAW ENFORCEMENT

By GEORGE M. ROBERTS, *Superintendent of Weights, Measures, and Markets, District of Columbia*

Mr. Chairman, ladies, and gentlemen, I fear that sometimes, we, as weights and measures officials, devote too much attention to regulation of mechanical devices, and too little attention to regulation of human devices.

The head of a weights and measures department who allows the work of his department to be confined to testing weighing and measuring instruments falls far short of performing his duty to the public.

Methods of merchandising have advanced to such a state of sophistication that those who desire to defraud the public no longer resort to the expedient of manipulating their scales, measures, gasoline pumps, or other instruments. The old-time methods of manipulation of instruments have been eliminated to a very large extent at least. The machinations now resorted to frequently represent a high degree of efficiency resembling schemes planned by so-called "efficiency engineers." Some such schemes, when finally uncovered, are amazing in their simplicity.

The meat dealer no longer weighs his hand. One of the tricks now used by meat dealers is to place the commodity on the scale, remove it quickly, and announce the total price in excess of what it should be. The customer usually accepts his statement, pays his money, and happily goes on his way unconscious of the fact that he has been swindled. The motorist drives into a filling station, orders the quantity of gasoline he desires to buy, looks at the hand on the dial of the pump, sees that it points to the figure representing the number of gallons he has ordered, and pays his money, wholly unconscious of the fact that the pump operator may have started his pump on one gallon, or resorted to some other deceptive means to deliver a gallon short measure.

Another method used in some instances, where goods are put up in packages, is to reduce the weight of each package slightly below the quantity represented. While each customer may be defrauded to a very small extent, in a busy store, or a large chain of stores, where

Digitized by Google

such packages are sold, the fraud may aggregate several dollars per day, and in the course of a year amount to a very large sum of money.

It is considered unnecessary to go into great detail here. Weights and measures officials are familiar, or at least should be familiar, with many of the tricks and schemes used possibly to a much larger extent than the general public believes.

It is the function of a weights and measures department to see that purchasers of merchandise receive the quantity for which they pay. That is a duty which should be fully performed. As indicated in the beginning, it is not enough to see that scales, measuring pumps, and other devices are correct. The performance of that duty is only a preliminary step in the accomplishment of the real purpose for which a weights and measures department is maintained.

Every well organized weights and measures department should maintain a staff of keen-minded investigators and undercover buyers. The value of such a staff to the people of every city can hardly be overestimated. They discover the evidence upon which prosecutions are based, assist in preparing cases for court, appear as witnesses, and act as consultants for prosecuting attorneys. These investigators should be persons of unusual intelligence, and well informed regarding methods pursued in every line of business.

The weights and measures department of the District of Columbia lacks much of having the facilities and the number of employees needed to protect the public in this city. Nevertheless, the department has done a considerable amount of work along the lines indicated, and in some instances the results have been astounding.

Only a few specific instances will be discussed.

Last year an investigation was made regarding the sale of gasoline to motorists. A man not generally known to be an employee of the weights and measures department was detailed to visit filling stations, converse with employees, and otherwise obtain all the information possible in regard to the way the business was being operated. It was not possible, of course, to have him visit all the filling stations in the city, but he investigated the operation of a number owned by different concerns. It was not long before the information obtained by him indicated that a large amount of fraud was being perpetrated at filling stations owned by a corporation operating more than 60 stations in this city. It was then decided to have an undercover buyer make purchases at stations operated by the corporation in question. Eight stations were selected for making trial purchases. Each purchase was of 5 gallons. Out of 36 purchases made, short measure was delivered 23 times. The shortages were from 6 ounces to 2 gallons on each purchase. Several of them amounted to 1 gallon or more. In other instances the short measure amounted to almost a gallon. Prosecution was instituted against the corporation. It employed two of the largest firms of lawyers in Washington to defend it, but finally paid $1,000 without going into court to fight the case.

The facts in this case clearly tended to indicate that the methods pursued by the corporation in connection with its requirements of accounting on the part of its employees was largely responsible for the sale of short measure at its filling stations. Its methods were investigated in much detail. After prosecution the methods of the concern were changed.

Digitized by Google

Very recently undercover buyers for the District of Columbia weights and measures department made a large number of purchases of meats from stores catering chiefly to laboring people, both Negroes and whites, and to persons on relief rolls.

Records of a few of the purchases made are included:

Store 1.—February 2, 1935. Shoulder, represented to weigh 4 pounds, 3 ounces, actual weight 3 pounds 5 ounces, short weight 14 ounces; February 2, 1935. Beef roast, represented to weigh 9 pounds, 7 ounces, actual weight 8 pounds, 6 ounces, short weight 1 pound, 1 ounce; February 9, 1935. Ham, represented to weigh 8 pounds, 10 ounces, actual weight 8 pounds, short weight 10 ounces; February 9, 1935. Beef roast, represented to weigh 8 pounds, 13 ounces, actual weight 8 pounds, 9 ounces, short weight 4 ounces.

Store 2.—February 4, 1935. Smoked shoulder, represented to weigh 11 pounds, actual weight 9 pounds, 14 ounces, short weight 1 pound, 2 ounces; February 4, 1935. Lard, represented to weigh 2 pounds, actual weight 1 pound, 13 ounces, short weight 3 ounces; February 9, 1935. Shoulder, represented to weigh 5 pounds, 5 ounces, actual weight 5 pounds, short weight 5 ounces; February 9, 1935. Beef roast, represented to weigh 4 pounds, 9 ounces, actual weight 3 pounds, 11 ounces, short weight 14 ounces; February 9, 1935. Shoulder, represented to weigh 5 pounds, 12 ounces, actual weight 5 pounds, 8 ounces, short weight 4 ounces.

Store 3.—February 5, 1935. Smoked shoulder, represented to weigh 5 pounds, 10 ounces, actual weight 4 pounds, 14 ounces, short weight 12 ounces; February 5, 1935. Corned shoulder, represented to weigh 5 pounds, 7 ounces, actual weight 4 pounds, 14 ounces, short weight 9 ounces; February 5, 1935. Fresh shoulder, represented to weigh 5 pounds, 8 ounces, actual weight 4 pounds, 11 ounces, short weight 13 ounces; February 5, 1935. Beef roast, represented to weigh 6 pounds, 10 ounces, actual weight 5 pounds, 8 ounces, short weight 1 pound, 2 ounces; February 5, 1935. Fresh shoulder, represented to weigh 5 pounds, actual weight 4 pounds, 6 ounces, short weight 10 ounces.

Store 4.—March 2, 1935. Smoked shoulder, represented to weigh 5 pounds, 6 ounces, actual weight 4 pounds, 11 ounces, short weight 11 ounces; March 2, 1935. Roast beef, represented to weigh 5 pounds, actual weight 4 pounds, 9 ounces, short weight 7 ounces; March 9, 1935. Smoked shoulder, represented to weigh 4 pounds, 14 ounces, actual weight 4 pounds, 5 ounces, short weight 9 ounces.

Similar short weights were received at other stores. It would make this paper too long to include all of them. In all the stores mentioned, scales were correct. The fault was with the management.

The instances referred to show conclusively to my mind the value of employment of undercover buyers. In all cases similar to those herein mentioned the store proprietors were prosecuted. Fines ranged from $75 to $250.

A few weeks ago purchases of breakfast bacon made by one of our buyers at several stores of one of the chain systems operating here showed an average of 7 percent short weight. Prosecution has been instituted, but the case has not yet been terminated.

For a good many years Congress has made a small annual appropriation of funds for our department to use in making undercover purchases. The appropriation is not as large as might well be employed. Most of the time in the past the appropriation has been $500 per year. When the facts regarding our discoveries were placed before the Appropriations Committee of the Senate at the present session of Congress the committee not only doubled the amount for undercover buying, but also provided for a substantial increase in our investigational force.

In conclusion, I wish to say that during the present year, my office has had the hearty cooperation of the consumers council of the District of Columbia, which has been very much appreciated.

Digitized by Google

The CHAIRMAN. Thank you, Mr. Roberts.

Mr. HOLBROOK. I think that the Conference owes a vote of thanks to Mr. Roberts for his consideration in displaying his test truck to us for so long a period of time at the Bureau. I think the Conference appreciates your assistance, Mr. Roberts.

The CHAIRMAN. We are very glad you did so, Mr. Roberts.

Mr. ROBERTS. I am always glad to attend these National Conferences. We are always glad to have officials from other cities come here.

REPORT OF COMMITTEE ON RESOLUTIONS, PRESENTED BY C. D. BAUCOM, CHAIRMAN

Your committee on resolutions desires to submit the following resolutions for your consideration.

IN MEMORY OF DR. SAMUEL W. STRATTON

Whereas by the death of our most dearly beloved and esteemed ex-president and former Director of the National Bureau of Standards, Dr. Samuel W. Stratton, this National Conference on Weights and Measures has lost one of its most valuable, enthusiastic, and sincere members; and

Whereas Dr. Stratton through his keen foresight and realization of the importance of weights and measures and their relations to the masses of the people, originated the idea and developed it into the formation of this National Conference: Therefore be it

Resolved, That we of the National Conference on Weights and Measures, assembled at the National Bureau of Standards, Washington, D. C., June 4–7, 1935, do hereby pass this resolution in memory of our departed brother; and be it further

Resolved, That this resolution be made a part of the record of this Conference, and that a copy be sent by the secretary to Dr. Stratton's family.

IN MEMORY OF DR. GEORGE K. BURGESS

Whereas by the death of our dearly beloved president, Dr. George K. Burgess, this National Conference on Weights and Measures has lost one of its most valuable members, and

Whereas Dr. Burgess was ever ready with counsel and encouragement to assist any one of us in meeting the problems of this work: Therefore be it

Resolved, That we of the National Conference on Weights and Measures, assembled at the National Bureau of Standards, Washington, D. C., June 4–7, 1935, do hereby pass this resolution in memory of our departed brother; and be it further

Resolved, That this resolution be made a part of the record of this Conference, and that a copy be sent by the secretary to Dr. Burgess's family.

(After the reading of the above resolutions it was moved and seconded that these be adopted by a rising vote, the question was taken in the manner suggested, and the motion was thus agreed to.)

IN MEMORY OF OUR DEPARTED BROTHERS

Whereas we have lost from our ranks since the last Conference in 1931, through the plan of Divine Providence, a goodly number of our members; and

Whereas our associations with these gentlemen have been an inspiration in prompting us to go forward with a greater determination to carry on the ideals set by them: Therefore be it

Resolved, That we of the National Conference on Weights and Measures, assembled at the National Bureau of Standards, Washington, D. C., June 4–7, 1935, do hereby draw up this resolution as an expression of our sincere sorrow at their passing.

APPRECIATION TO OFFICIALS COOPERATING

Whereas the Governors, county, and city officials of the various States, counties, and cities, through their manifest interest in weights and measures work, have made it possible by their cooperation for their jurisdictions to be represented at

Digitized by Google

this, the Twenty-fifth National Conference on Weights and Measures, held in the Nation's Capital at Washington, and

Whereas such cooperation and attendance have made it possible to adopt uniform regulations for the various jurisdictions, and in various other ways to facilitate the improvement of weights and measures departments: Therefore be it

Resolved, That a letter of appreciation with a copy of this resolution be forwarded to these various officials by the secretary of the Conference thanking them for their cooperation.

APPRECIATION TO THE DIRECTOR AND STAFF OF THE NATIONAL BUREAU OF STANDARDS

Whereas Dr. Lyman J. Briggs, Mr. E. C. Crittenden, and Dr. A. S. McAllister, and their most able and efficient staff, have extended valuable assistance and guidance to this Conference: Therefore be it

Resolved, That this Conference go on record in sincere and grateful appreciation of their cooperation in the making of this Conference a success.

APPRECIATION TO THE PRESS

Whereas the representatives of the press of Washington have given valuable space in their papers and have given freely of their time in the interest of publicity of the proceedings of our Conference: Therefore be it

Resolved, That we, the Twenty-fifth National Conference on Weights and Measures, express our appreciation to the press for such services.

IN RELATION TO RULES OF PROCEDURE FOR THE NATIONAL CONFERENCE

Whereas this National Conference on Weights and Measures recommends to the various States and jurisdictions the adoption and enforcement of rules, regulations, specifications, and tolerances promulgated and adopted by this Conference; and

Whereas a large number of such jurisdictions have by law or otherwise accepted and/or carried out the recommendations as promulgated and recommended by this Conference; and

Whereas our procedure in the promulgation of such rules, regulations, specifications, and tolerances has been set more or less by precedent: Therefore be it

Resolved, That this National Conference on Weights and Measures assembled at Washington, D. C., June 4–7, 1935, do hereby adopt the following rules of procedure governing the promulgation, deliberation, and recommendation of such rules, regulations, specifications, and tolerances, subject to amendment from the floor by addition or deletion at the will of the Conference. The will of the Conference shall be determined by a majority vote of the qualified members of the Conference.

1. Immediately following the opening of the conference or as soon thereafter as practicable within the first half of the meeting, the committee on specifications and tolerances shall make report of any contemplated changes or additions in previously adopted rules, regulations, specifications, and tolerances, and any contemplated change or proposal by a member of the Conference shall be presented within this same period, all of which is in order that members may have sufficient time for deliberation and careful study of the proposed changes or additions.

2. In general the procedure shall be in accordance with Roberts Rules on Parliamentary Procedure insofar as it is applicable to this Conference and not contrary to any specific rules and regulations adopted by this Conference.

3. The program committee shall arrange for sufficient time to be granted members of the Conference to fully discuss on the floor the weights and measures problems confronting them in their jurisdictions and obtain from the exchange of ideas ways and means of coping with similar problems.

4. Such matters as are referred to the committee on specifications and tolerances shall be reported back to the Conference as soon as possible, with their recommendations, in order that free discussion may be had prior to final action by the Conference.

5. It is the wish and desire of this Conference that any member having in mind the introduction of a new rule, regulation, specification, or tolerance or the introduction of a proposition of special interest to the Conference, send to the secretary of the Conference, well in advance of the meeting at which such pro-

Digitized by Google

posal is to be considered, a copy of such proposal in order that such action as necessary may be taken by either the program committee or the committee on specifications and tolerances in relation thereto.

(Signed) C. D. BAUCOM, *Chairman*,
JOHN J. LEVITT,
GEORGE S. BARNARD,
WILLIAM F. STEINEL,
JACOB M. VANDERSLICE,
ALEXANDER HAMILTON,
WALTER F. STILES,
Committee on Resolutions.

DISCUSSION OF ABOVE REPORT

(It was moved and seconded that the third resolution "In Memory of Our Departed Brothers" be adopted by a rising vote, the question was taken in the manner suggested, and the motion was thus agreed to.)

Mr. BAUCOM. In relation to the seventh resolution, the last to be read, I may say, gentlemen, that this has been drawn up with the idea that it will help along the good will and harmony of this Conference. We have drawn this resolution for your valuable consideration; and for adoption if you see fit to take this step.

(It was moved and seconded that the seventh resolution be adopted.)

Mr. ROGERS. In relation to the last resolution read, relative to procedure, I don't think the matter can be handled in that way even if it be the wish of the Conference that something of that nature really ought to be done, since the Conference has never adopted a constitution or a set of bylaws.

I move that this resolution be tabled.

(The motion was seconded.)

Mr. BAUCOM. I am not going to contend or argue for the resolution. To explain it, however, I may say that there seemed to be a feeling among some of the delegates here that they were not given an opportunity to express themselves and exchange ideas. It is true that we do not have any constitution or bylaws. We have no rules and regulations to control our activities. Such things have been proposed two or three times in the past, but have never been adopted. It seemed fitting then, that we could at least recommend a resolution at this time that could be granted consideration, on problems of vital interest to the delegates.

The CHAIRMAN. I wonder whether you had in mind program item 35, "General Consideration of Subjects of Interest and Questions Brought Up for Discussion by Officials."

Mr. BAUCOM. It is true that there is such an item, but this comes so late in the program we never get to it. We think it should be moved up so that we get to it before the conference is nearing a close, when we have some of these other items at the end of the program moved ahead of it. If you gentlemen do not want the resolution, I am quite sure it is all right so far as I am concerned. We just wanted to do what we thought was best for the conference.

The CHAIRMAN. The motion before the house is to lay on the table the resolution of the committee in relation to procedure.

(The question was taken by yea-and-nay vote, and the issue was in doubt. Thereupon a rising vote was taken and upon the count showing 15 in favor of the motion to table and 14 opposed, the motion was agreed to.)

Digitized by Google

(It was moved and seconded that the remaining resolutions of the committee not yet considered be adopted as presented by the committee, the question was taken, and the motion was agreed to.)

CREATION OF COMMITTEE ON CONSTITUTION AND BYLAWS

Mr. GRIFFITH. Mr. Chairman, I think we have a way of meeting the situation so lately presented by the committee on resolutions, and which it is very evident should receive consideration and attention. I make the motion that the Chair, or the president, appoint a committee of not less than three members of the conference to draw up a constitution and set of bylaws for the guidance of this organization.

This year more than 50 percent of the officials in attendance were new men, entirely unacquainted as to how to go about it, to do anything. Certainly a body of the size of this—over 200 attendants—should have rules and regulations of procedure. It is marvelous to see the great amount of work we accomplish more or less in a haphazard way. I think it will be a step forward, and will better maintain our balance and simplify our procedure, to have drafted a constitution and bylaws.

(The motion was seconded, the question was taken, and the motion was agreed to.)

REPORT OF THE TREASURER, GEORGE F. AUSTIN, JR.

Receipts:			
Balance on hand June 1, 1931			$74. 84
Dues from delegates			212. 00
Interest received			11. 50
Total receipts			298. 34
Disbursements:			
1931, June 1	5 receipt books	$1. 25	
	Flowers in memory of H. J. Foley	10. 00	
	Wreath in memory of L. A. Fischer	10. 00	
	Candy for stenographers	11. 00	
	Cigars for reporter	15. 00	
	Fees (2 messengers)	10. 00	
	Telephones	1. 70	
1932, May 6	Flowers in memory of W. A. Payne	10. 00	
	Wreath in memory of L. A. Fischer	10. 00	
	Wreath in memory of Dr. G. K. Burgess	10. 00	
Total disbursements			88. 95
Balance on hand June 1, 1935			209. 39

Respectfully submitted.

(Signed) GEO. F. AUSTIN, Jr., *Treasurer.*

(The report was duly accepted.)

CONSIDERATION OF HOTEL HEADQUARTERS FOR THE TWENTY-SIXTH NATIONAL CONFERENCE

The CHAIRMAN. Gentlemen, the next item of business is the selection of hotel headquarters for the Twenty-Sixth National Conference.

Mr. HOLBROOK. We have proposals from three hotels in town, namely, Hotel Washington, The Willard, and The Mayflower. We circularized the members of the executive committee on additional hotels this year, but it is believed a satisfactory choice can be made from among these three.

Digitized by Google

(Mr. Holbrook read the proposals.)

Mr. NASON. I believe we ought to take a hotel where it is possible for some of the men to get rooms for $2 and $2.50. The reason there were not more city men here at this Conference is that in some cities the salaries are small, and it isn't easy for them to pay higher rates.

Mr. ROGERS. I feel that so many delegates come here representing widely separated sections, that it would be advisable to refer this matter to the executive committee of the Conference. I put that in the form of a motion.

(The motion was seconded, the question was taken, and the motion was agreed to.)

MOTION IN RELATION TO EXPENDITURES

Mr. ROGERS. Mr. Chairman, I would like to offer a motion that the secretary be authorized to pay the customary expenses incident to this Conference and that Mr. Holbrook's draft upon the treasurer be honored by Mr. Austin, treasurer.

(The motion was seconded, the question was taken, and the motion was agreed to.)

TRIBUTE TO JOHN H. AUSTIN

The CHAIRMAN. Just before we adjourn, I am going to ask the delegates of this Conference to bear with me, as there is one matter which weighs heavily on my mind, the accidental death of John H. Austin, delegate from Maine. As we prepare to go back to our homes, we remember that John Austin cannot do that. I am going to ask the Conference to stand in silence for a brief moment in tribute to our departed delegate.

(The members of the Conference stood in tribute to John H. Austin.)

Mr. GRIFFITH. The last number on the program is "Suggestions for Program of Twenty-Sixth Conference." This might well be considered by the various delegates, between now and next year, and I would suggest that from time to time as suggestions of interest arise, they forward these suggestions to the secretary of the Conference. If we wait until the approach of the date of the next Conference these suggestions will be lost, and we will be without the advantage of valuable items. I suggest especially that new members avail themselves of this opportunity. I offer the facilities of my office to any delegate for any information which I may be able to give them.

Mr. BAUCOM. Before we adjourn; did the chair appoint a committee to draw up a constitution and bylaws?

The CHAIRMAN. It is the wish of the Chair to allow that power to rest in the hands of the president of the Conference, Dr. Briggs.

Mr. BAUCOM. I did not understand the motion that it be left in the hands of the president to do that.

The CHAIRMAN. I want to make that clear. I will take no action in relation to the appointment of that committee.

(A motion was made and seconded that the Conference adjourn, the question was taken, and the motion was agreed to.)

(Thereupon, at 1:13 p. m., the Twenty-Fifth National Conference on Weights and Measures adjourned sine die.)

○

34678—36——11

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

TR

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

REPORT OF THE TWENTY-SIXTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

ATTENDED BY REPRESENTATIVES
FROM VARIOUS STATES

HELD AT THE NATIONAL BUREAU OF STANDARDS
WASHINGTON, D. C., JUNE 9, 10, 11, AND 12, 1936

MISCELLANEOUS PUBLICATION M157

CORNELL
UNIVERSITY
LIBRARY
Digitized by Google

CORNELL
UNIVERSITY
LIBRARY

Digitized by Google

Digitized by Google



Official photograph of delegates and guests attending the Twenty-Sixth National Conference on Weights and Measures, assembled at the National Bureau of Standards.

(Large-capacity scale-testing equipments of the State of New Jersey and the city of New York, N. Y., in background.)

Digitized by Google

U. S. DEPARTMENT OF COMMERCE
DANIEL C. ROPER, Secretary
NATIONAL BUREAU OF STANDARDS
LYMAN J. BRIGGS, Director

MISCELLANEOUS PUBLICATION M157

REPORT OF THE TWENTY-SIXTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

ATTENDED BY REPRESENTATIVES
FROM VARIOUS STATES

HELD AT THE NATIONAL BUREAU OF STANDARDS
WASHINGTON, D. C., JUNE 9, 10, 11, and 12, 1936

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1937

For sale by the Superintendent of Documents, Washington, D. C. - - - - - - - Price 20 cents

Digitized by Google

459360

Digitized by Google

OFFICERS AND COMMITTEES

OFFICERS

(Serving during Twenty-sixth National Conference)

President, LYMAN J. BRIGGS, Director, National Bureau of Standards, Washington, D. C.
First vice president, JOHN P. MCBRIDE, Director, State Division of Standards, Boston, Mass.
Second vice president, C. D. BAUCOM, State Superintendent of Weights and Measures, Raleigh, N. C.
Third vice president, MARTIN L. LANG, State Commissioner of Weights and Measures, Indianapolis, Ind.
Fourth vice president, J. C. TINKEY, Deputy State Sealer, Columbus, Ohio.
Secretary, F. S. HOLBROOK, National Bureau of Standards, Washington, D. C.
Treasurer, GEORGE F. AUSTIN, Jr., Supervising Inspector of Weights and Measures, Detroit, Mich.

(As elected by Twenty-sixth National Conference for the ensuing year)

President, LYMAN J. BRIGGS, Director, National Bureau of Standards, Washington, D. C.
Vice presidents:
C. D. BAUCOM, State Superintendent of Weights and Measures, Raleigh, N. C.
C. J. P. CULLEN, Director, State Bureau of Standard Weights and Measures, Harrisburg, Pa.
JOHN J. LEVITT, State Superintendent of Standards, Springfield, Ill.
JOHN P. MCBRIDE, Director, State Division of Standards, Boston, Mass.
Secretary, F. S. HOLBROOK, National Bureau of Standards, Washington, D. C.
Treasurer, GEORGE F. AUSTIN, Jr., Supervising Inspector of Weights and Measures, Detroit, Mich.

COMMITTEES

EXECUTIVE COMMITTEE

(As elected by Twenty-sixth National Conference)

LYMAN J. BRIGGS
C. D. BAUCOM
C. J. P. CULLEN
JOHN J. LEVITT
JOHN P. MCBRIDE
F. S. HOLBROOK
GEORGE F. AUSTIN, Jr.
} *Ex officio.*

RUSSELL S. ACKERMAN, Superintendent, Department of Licenses, Weights, and Measures, Minneapolis, Minn.
JOHN W. BATES, Sealer of Weights and Measures, Detroit, Mich.
W. S. BUSSEY, Chief Inspector, State Division of Weights and Measures, Austin, Texas.
HOWARD E. CRAWFORD, Inspector of Weights and Measures, Jacksonville, Fla.
J. M. DANIELS, Chief State Inspector of Weights and Measures, Lansing, Mich.
H. N. DAVIS, Deputy State Commissioner of Weights and Measures, Montpelier, Vt.
J. B. FINK, Assistant Director, State Department of Agriculture, Olympia, Wash.
EDWARD R. FISHER, State Sealer of Weights, Measures, and Balances, Providence, R. I.
S. T. GRIFFITH, Chief, Division of Weights and Measures, Baltimore, Md.
C. L. JARRETT, State Commissioner of Weights and Measures, Charleston, W. Va.
WILLIAM A. JONES, Sealer of Weights and Measures, Waterville, Maine.
MARTIN L. LANG, State Commissioner of Weights and Measures, Indianapolis, Ind.

Digitized by Google

SETH L. LIGHTFOOT, State Inspector of Weights and Measures, Phoenix, Ariz.
JAMES O'KEEFE, Inspector of Weights and Measures, Chicago, Ill.
B. W. RAGLAND, Chief, Bureau of Weights and Measures, Richmond, Va.
C. J. REYNOLDS, Director, State Bureau of Weights and Measures, Albany, N. Y.
GEORGE M. ROBERTS, District Superintendent of Weights, Measures, and Markets, Washington, D. C.
EDWARD K. STROBRIDGE, Sealer of Weights and Measures of Alameda County, Oakland, Calif.
LOUIS G. WALDMAN, Commissioner of Weights and Measures, St. Louis, Mo.
GEORGE WARNER, Chief State Inspector of Weights and Measures, Madison, Wis.
WALTER G. WHITE, State Commissioner of Weights and Measures, Concord, N. H.
S. H. WILSON, State Oil Chemist, Atlanta, Ga.

COMMITTEE ON SPECIFICATIONS AND TOLERANCES

(Standing committee)

F. S. HOLBROOK, National Bureau of Standards, Washington, D. C.
CHARLES M. FULLER, Sealer of Weights and Measures of Los Angeles County, Los Angeles, Calif.
JOSEPH G. ROGERS, Assistant State Superintendent of Weights and Measures, Trenton, N. J.
JOHN P. MCBRIDE, Director, State Division of Standards, Boston, Mass.
GEORGE F. AUSTIN, Jr., Supervising Inspector of Weights and Measures, Detroit, Mich.

ACTING COMMITTEES FOR THE TWENTY-SIXTH NATIONAL CONFERENCE

Committee on Nominations.—JOHN J. LEVITT, of Illinois, chairman; MARTIN L. LANG, of Indiana; HARRY S. PROVOST, of New Jersey; S. H. WILSON, of Georgia; JAMES A. BOYLE, of Portland, Maine; S. T. GRIFFITH, of Baltimore, Md.; and LOUIS G. WALDMAN, of St. Louis, Mo.

Committee on Resolutions.—WALTER G. WHITE, of New Hampshire, chairman; W. S. BUSSEY, of Texas; J. M. DANIELS, of Michigan; J. B. FINK, of Washington; C. P. SMITH, of Suffolk County, N. Y.; EDWARD K. STROBRIDGE, of Alameda County, Calif.; and JAMES A. SWEENEY, of Boston, Mass.

In Charge of Exhibits.—B. L. PAGE.

In Charge of Registrations.—Mrs. H. E. ROSENBERGER.

Digitized by Google

PERSONS ATTENDING THE CONFERENCE

DELEGATES—STATE, CITY, AND COUNTY OFFICIALS

ALABAMA

City: Birmingham — R. M. JOHNSON, Chief Inspector of Weights and Measures, City Hall.

CALIFORNIA

State — C. E. TUCKER, Chief, Division of Weights and Measures, Sacramento.

County: Alameda — EDWARD K. STROBRIDGE, Sealer of Weights and Measures, 829 Harrison Street, Oakland.

CONNECTICUT

State — C. L. KLOCKER, Inspector of Weights and Measures, 100 Washington Street, Hartford.

City:

Bridgeport — LOUIS SNOW, Sealer of Weights and Measures, 925 Main Street.

Stamford — FRANK G. SMITH, Sealer of Weights and Measures.

DISTRICT OF COLUMBIA

District — GEORGE M. ROBERTS, Superintendent of Weights, Measures, and Markets, 467 C Street.

FLORIDA

State — NALLS BERRYMAN, Assistant State Chemist, Tallahassee.

City:

Jacksonville — HOWARD E. CRAWFORD, Inspector of Weights and Measures, Utilities Building.

Miami — H. E. HOWARD, Inspector of Weights and Measures, City Hall.

ALBERT C. SPIRES, Secretary, Rate and Traffic Division, Courthouse.

GEORGIA

State — S. H. WILSON, State Oil Chemist, State Capitol, Atlanta.

ILLINOIS

State — JOHN J. LEVITT, Superintendent of Standards, Statehouse, Springfield.

VIVIENNE MANNEN, Secretary, State Division of Standards, Statehouse, Springfield.

City: Chicago — JAMES O'KEEFE, Inspector of Weights and Measures, City Hall.

INDIANA

State — MARTIN L. LANG, Commissioner of Weights and Measures, Statehouse Annex, Indianapolis.

GREGORY G. BALTAS, Inspector of Weights and Measures, Statehouse Annex, Indianapolis.

HERBERT G. MEYER, Inspector of Weights and Measures, Statehouse Annex, Indianapolis.

City: Gary — CLEO C. MORGAN, Sealer of Weights and Measures, City Hall.

Digitized by Google

KENTUCKY

City: Louisville	WILLIAM H. ISING, Jr., Chief Inspector of Weights and Measures, City Hall.

MAINE

City:	
Portland	JAMES A. BOYLE, Sealer of Weights and Measures, City Building.
Waterville	WILLIAM A. JONES, Sealer of Weights and Measures, City Hall.

MARYLAND

State	S. B. SHAW, Chief, Department of Markets, College Park.
City: Baltimore	S. T. GRIFFITH, Chief, Division of Weights and Measures, Municipal Building.
	CHARLES G. CROCKETT, Inspector of Weights and Measures, Municipal Building.
	JOHN R. GRAEFF, Inspector of Weights and Measures, Municipal Building.
	GEORGE H. LEITHAUSER, Inspector of Weights and Measures, Municipal Building.
	THOMAS J. NAPFEL, Inspector of Weights and Measures, Municipal Building.
	ELMER E. NICHOLSON, Inspector of Weights and Measures, Municipal Building.
	FRED J. O'GORMAN, Inspector of Weights and Measures, Municipal Building.
	ELMER S. PIERPONT, Inspector of Weights and Measures, Municipal Building.
	HENRY SLITZER, Assistant Inspector of Weights and Measures, Municipal Building.

MASSACHUSETTS

State	JOHN P. MCBRIDE, Director of Standards, Statehouse, Boston.
City:	
Boston	JAMES A. SWEENEY, Sealer of Weights and Measures, City Hall Annex.
Haverhill	JOHN R. BOOTH, Sealer of Weights and Measures, City Hall.
Taunton	EDWARD C. WARD, Sealer of Weights and Measures.

MICHIGAN

State	J. M. DANIELS, Chief Inspector of Weights and Measures, Lansing.
City:	
Dearborn	CHARLES C. WEIMER, Sealer of Weights and Measures.
Detroit	JOHN W. BATES, Sealer of Weights and Measures, 1300 Beaubien Street.
	GEORGE F. AUSTIN, Jr., Supervising Inspector of Weights and Measures, 1300 Beaubien Street.
Hamtramck	ARTHUR J. WILHELM, Sealer of Weights and Measures, 2444 Andrus Street.
Highland Park	MANON L. FOWLER, Sealer of Weights and Measures, 25 Gerald Avenue.
Lansing	CHARLES T. QUINN, Sealer of Weights and Measures, Grand and Shiawassee Streets.

MINNESOTA

City: Minneapolis	RUSSELL S. ACKERMAN, Superintendent, Department of Licenses, Weights and Measures, City Hall.

Digitized by Google

MISSOURI

City: St. Louis	Louis G. Waldman, Commissioner of Weights and Measures, City Hall.

NEW HAMPSHIRE

State	Walter G. White, Commissioner of Weights and Measures, Statehouse, Concord. Harry G. Hager, Inspector of Weights and Measures, Statehouse, Concord. William H. Mann, Inspector of Weights and Measures, Littleton. Edwin H. Thomas, Inspector of Weights and Measures, Farmington.

NEW JERSEY

State	Joseph G. Rogers, Assistant Superintendent and Secretary, Department of Weights and Measures, 187 West Hanover Street, Trenton. Rowland K. Bodenwieser, Assistant Superintendent of Weights and Measures, 187 West Hanover Street, Trenton. Elliott B. Holton, Assistant Superintendent of Weights and Measures, 187 West Hanover Street, Trenton. Harry S. Provost, Assistant Superintendent of Weights and Measures, 187 West Hanover Street, Trenton. Archie T. Smith, Inspector of Weights and Measures, 187 West Hanover Street, Trenton.
City:	
Elizabeth	William J. Bender, Superintendent of Weights and Measures, City Hall.
Jersey City	John S. Burke, Superintendent of Weights and Measures, City Hall.
Trenton	Francis J. Black, Superintendent of Weights and Measures, City Hall.
County:	
Bergen	Alfred F. Barnard, Superintendent of Weights and Measures, Administrative Building, Hackensack.
Burlington	Curwen B. Fisher, Superintendent of Weights and Measures, 34 Brainerd Street, Mount Holly.
Cape May	Gilbert S. Smith, Superintendent of Weights and Measures, Avalon.
Gloucester	William P. Abdill, Superintendent of Weights and Measures, Woodbury.
Hudson	Thomas J. Waldron, Superintendent of Weights and Measures, Courthouse, Jersey City.
Mercer	Ralph M. Bodenweiser, Superintendent of Weights and Measures, Courthouse, Trenton.
Middlesex	Charles H. Engelhard, Superintendent of Weights and Measures, County Offices, New Brunswick.
Monmouth	Glenn L. Berry, Superintendent of Weights and Measures, Asbury Park.
Morris	Charles S. Wandling, Superintendent of Weights and Measures, Courthouse, Morristown.
Somerset	O. B. Mathews, Superintendent of Weights and Measures, Courthouse, Somerville.

Digitized by Google

NEW YORK

City:	
New York	MATTHEW J. DISERIO, Deputy Commissioner, Department of Public Markets, Weights, and Measures, 139 Centre Street. MATTHIAS A. HARRINGTON, Chief Supervisor, Department of Public Markets, Weights, and Measures, 139 Centre Street. WILLIAM J. COAKLEY, Chief Clerk, Department of Public Markets, Weights, and Measures, 139 Centre Street.
Rochester	MARTIN J. MACK, Sealer of Weights and Measures, 34 Court Street.
Syracuse	JAMES H. CAHILL, Sealer of Weights and Measures, Syracuse Public Market.
County:	
Monroe	EARL D. HUBBLE, Deputy Sealer of Weights and Measures, 1400 South Avenue, Rochester.
Niagara	E. M. COYLE, Sealer of Weights and Measures, 366 Willow Street, Lockport.
Suffolk	C. P. SMITH, Sealer of Weights and Measures, Box 412, East Moriches.

NORTH CAROLINA

State	C. D. BAUCOM, Superintendent of Weights and Measures, Box 1066, Raleigh. ORAL L. YATES, Inspector of Weights and Measures, Raleigh.
City:	
Asheville	M. L. DANIEL, Inspector of Weights and Measures, City Hall.
Raleigh	G. R. STALLINGS, Sealer of Weights and Measures, 435 Cutter Street.
Winston-Salem	B. K. JONES, Inspector of Weights and Measures.
County:	
Guilford	W. H. BLAYLOCK, Inspector of Weights and Measures, Guilford.
City and County: Charlotte, and Mecklenburg County.	F. C. YARBROUGH, Sealer of Weights and Measures, 300 South Poplar Street, Charlotte.

OHIO

State	O. E. BRENNEMAN, Chief, Bureau of Weights and Measures, State Office Building, Columbus. J. C. TINKEY, Deputy State Sealer, State Office Building, Columbus.
County:	
Licking	C. R. MCFADDEN, Sealer of Weights and Measures, Pataskala.

PENNSYLVANIA

State	C. J. P. CULLEN, Director, Bureau of Standard Weights and Measures, Harrisburg.
City:	
Allentown	JAMES E. MCHUGH, Inspector of Weights and Measures, City Hall.
New Kensington	JOHN H. EVANS, Sealer of Weights and Measures, 221 Walnut Street.
Oil City	HENRY K. MOHR, Sealer of Weights and Measures, 509 East Front Street.
Reading	WILLIAM A. HIGH, Sealer of Weights and Measures.
Williamsport	R. J. WILSON, Inspector of Weights and Measures, City Hall.
York	IRVIN R. SHULTZ, Inspector of Weights and Measures, City Hall.

Digitized by Google

County:	
Adams	G. W. NAUGLE, Inspector of Weights and Measures, Orrtanna.
Bradford	R. L. BLOCHER, Sealer of Weights and Measures, Wyalusing.
Union	HOBERT R. SPAID, Sealer of Weights and Measures, 517 Market Street, Mifflinburg.
Wayne	CHARLES F. KELLAM, Inspector of Weights and Measures, Sterling.

RHODE ISLAND

State	EDWARD R. FISHER, State Sealer of Weights, Measures, and Balances, Statehouse, Providence.

TEXAS

State	W. S. BUSSEY, Chief Inspector, Division of Weights and Measures, Austin.

VERMONT

State	H. N. DAVIS, Deputy Commissioner of Weights and Measures, Montpelier.

VIRGINIA

State	J. H. MEEK, Director, Division of Markets State Office Building, Richmond.
	M. A. HUBBARD, Supervisor of Weights and Measures, State Office Building, Richmond.
City: Richmond	B. W. RAGLAND, Chief, Bureau of Weights and Measures, City Hall Annex.
	JOSEPH B. ECK, Sealer of Weights and Measures, City Hall Annex.
	E. S. WALKER, Sealer of Weights and Measures, City Hall Annex.
County: Arlington	E. M. MORELAND, Sealer of Weights and Measures, Courthouse, Arlington.

WASHINGTON

State	J. B. FINK, Assistant Director, Department of Agriculture, Olympia.

WEST VIRGINIA

State	C. L. JARRETT, Commissioner of Weights and Measures, Charleston.
	P. J. PELLEGRINI, Inspector of Weights and Measures, Charleston.

WISCONSIN

City: Milwaukee	WILLIAM F. STEINEL, Sealer of Weights and Measures, 1331 North Fifth Street.

OTHER DELEGATES, AND GUESTS APPEARING ON THE PROGRAM

BAUMES, HAROLD I., Director, Personnel Training, League of Virginia Municipalities, Richmond, Va.
BEARCE, H. W., National Bureau of Standards, Washington, D. C.
BRAITHWAITE, W. E., National Bureau of Standards, Washington, D. C.
BRIGGS, LYMAN J., Director, National Bureau of Standards, Washington, D. C.
DRAPER, Hon. ERNEST G., Assistant Secretary of Commerce, Washington, D. C.
GOULD, R. E., National Bureau of Standards, Washington, D. C.
HARRISON, M. J. J., Chairman, Committee on Method of Test of Motor-Truck Scales, National Scale Men's Association, Pennsylvania R. R., Altoona, Pa.
HOLBROOK, F. S., National Bureau of Standards, Washington, D. C.

Digitized by Google

HOLLAND, P. L., Chief Engineer, Public Service Commission, State of Maryland, Baltimore, Md.
JUDSON, L. V., National Bureau of Standards, Washington, D. C.
KERR, R. H., Senior Chemist, Bureau of Animal Industry, United States Department of Agriculture, Washington, D. C.
LETZKUS, C. R., National Bureau of Standards Master Scale Depot, 5800 W. 69th Street, Clearing Station, Chicago, Ill.
MILLER, D. R., National Bureau of Standards, Washington, D. C.
PEFFER, E. L., National Bureau of Standards, Washington, D. C.
PIENKOWSKY, A. T., National Bureau of Standards, Washington, D. C.
RICHARD, C. L., National Bureau of Standards Master Scale Depot, 5800 W. 69th Street, Clearing Station, Chicago, Ill.
SMITH, D. V., National Bureau of Standards Master Scale Depot, 5800 W. 69th Street, Clearing Station, Chicago, Ill.
SMITH, RALPH W., National Bureau of Standards, Washington, D. C.
SOUDER, WILMER, National Bureau of Standards, Washington, D. C.

GUESTS REPRESENTING MANUFACTURERS OF WEIGHING AND MEASURING DEVICES

American Can Co.:
ELMER NALL, Special Representative, 104 South Michigan Avenue, Chicago, Ill.
HENRY B. TOURTELLOT, 230 Park Avenue, New York, N. Y.
Barnes Products (Inc.): W. J. BARNES, President, 6521 John R Street, Detroit, Mich.
Bowser, S. F., & Co. (Inc.):
C. P. GRIFFITH, Chief Engineer, Fort Wayne, Ind.
E. C. MARSH, Sales Manager, Fort Wayne, Ind.
Brodie, Ralph N., Co. (Inc.): D. W. KINGSLEY, Eastern Manager, 425 Chrysler Building, New York, N. Y.
Buffalo Meter Co.: T. J. HARRINGTON, 2917 Main Street, Buffalo, N. Y.
Chatillon, John, & Sons:
P. T. BORTELL, Vice President, 89 Cliff Street, New York, N. Y.
J. GEORGE HUGEL, 89 Cliff Street, New York, N. Y.
Cincinnati Ball Crank Co.:
J. GLORE, Works Manager, Cincinnati, Ohio.
IRWIN A. HYNES, District Manager, Cincinnati, Ohio.
Comag Lens (Inc.):
ROBERT E. FOSDICK, President, Box 476, Dayton, Ohio.
LLOYD E. JACKSON, Vice President, 2900 West Riverview Avenue, Dayton, Ohio.
Continental Can Co.: O. G. JAKOB, Division Sales Manager, 100 East Forty-second Street, New York, N. Y.
Dayton Pump and Manufacturing Co.:
E. E. EICKMEYER, Vice President and General Manager, Dayton, Ohio.
G. W. EICHHOFF, Eastern Sales Manager, 441 Lexington Avenue, New York, N. Y.
Dover Stamping and Manufacturing Co.: LOUIS S. CLEAVES, Vice President and Sales Manager, Cambridge, Mass.
Erie Meter Systems (Inc.): L. R. OLSEN, Engineer, Box 559, Erie, Pa.
Exact Weight Scale Co.: JOHN G. SIMS, Vice President, 944 W. Fifth Avenue, Columbus, Ohio.
Fair Scale Co.: ALBERT VETH, Louisville, Ky.
Fairbanks, E. & T., & Co.: F. E. TOWNSEND, Chief Engineer, St. Johnsbury, Vt.
Fairbanks, Morse & Co.:
J. F. CRUIKSHANK, Special Sales Engineer, 900 South Wabash Avenue, Chicago, Ill.
C. A. HENNIE, Sales Representative, 205 Water Street, Baltimore, Md.
JEROME KENNEY, Sales Representative, 415 Normandy Avenue, Baltimore, Md.
Gilbert & Barker Manufacturing Co.: J. A. LOGAN, Springfield, Mass.
Gurley, W. & L. E.: FRANKLIN G. WILLIAMS, Washington Representative, 3621 Newark Street, Washington, D. C.

Digitized by Google

Hobart Manufacturing Co.:
S. M. TEMPLETON, Assistant Manager, Dayton Scale Division, Troy, Ohio.
KENNETH C. ALLEN, Scale Engineer, Dayton Scale Division, Troy, Ohio.
JOHN MILEWSKI, District Sales Agent, Dayton Scale Division, 43 Florida Avenue NE., Washington, D. C.
Howe Scale Co.:
C. A. LINDSAY, Branch Manager, 1011 Filbert Street, Philadelphia, Pa.
FRANK J. HAND, Sales Department, 1011 Filbert Street, Philadelphia, Pa.
International Business Machines Corporation:
HARRY S. EVANS, Washington Manager, 1111 Connecticut Avenue, Washington, D. C.
L. S. SMITHERS, Special Representative, 270 Broadway, New York, N. Y.
Jacobs Bros. Co. (Inc.): J. E. WOODLAND, Sales Manager, Detectogram Division, Brooklyn, N. Y.
Johnston & Jennings Co.:
H. H. FLEMING, Vice President, 877 Addison Road, Cleveland, Ohio.
LYON MCCANDLESS, Vice President, Oceco Division, Cleveland, Ohio.
C. H. BEEGLE, Cleveland, Ohio.
McGogy Pump Co.: D. H. MCGOGY, Chief Engineer, McMinnville, Oreg.
Martin & Schwartz (Inc.): E. C. SCHROEDEL, Sales Manager, 2933 Main Street, Buffalo, N. Y.
Milwaukee Pump and Tank Works: A. J. BOERGER, Vice President, Milwaukee, Wis.
Moore & Kling (Inc.): ELMER M. KLING, 221 High Street, Boston, Mass.
National Meter Co.:
RAYMOND H. BARGE, Engineer, Brooklyn, N. Y.
J. A. MCBRIDE, Sales Engineer, Brooklyn, N. Y.
National Pumps Corporation:
ERIC S. BERGNAN, Eastern District Manager, 122 East Forty-second Street, New York, N. Y.
WILLIAM H. DUNKER, Sales and Service Representative, 122 East Forty-second Street, New York, N. Y.
Neptune Meter Co.:
R. K. BLANCHARD, Vice President, 50 West Fiftieth Street, New York, N. Y.
GLENN D. FRYE, Sales Engineer, 50 West Fiftieth Street, New York, N. Y.
Peerless Weighing and Vending Machine Corporation:
L. D. CHAMBERS, 22–19 Forty-first Avenue, Long Island City, N. Y.
A. H. LILLIEDAHL, Traffic and Service Manager, 22–19 Forty-first Avenue, Long Island City, N. Y.
E. M. SCHIEMER, 3811 Copley Road, Baltimore, Md.
Pittsburgh Equitable Meter Co.:
H. I. BEARDSLEY, Manager, Oil and Gasoline Division, 400 North Lexington Avenue, Pittsburgh, Pa.
W. H. MARSH, 7800 Susquehanna Street, Pittsburgh, Pa.
E. E. SPARGO, 50 Church Street, New York, N. Y.
Richardson Scale Co.: H. RICHARDSON, President, Clifton, N. J.
Schirmer Dornbirer Co.: W. P. SCHIRMER, President, Cleveland, Ohio.
Seraphin Test Measure Co.: THEO. A. SERAPHIN, President, 1314 North Seventh Street, Philadelphia, Pa.
Service Station Equipment Co.: C. A. DESIMONE, Manager, Weights and Measures Department, Conshohocken, Pa.
Silent Hoist Winch and Crane Co.: J. W. WUNSCH, Chief Engineer, 762 Henry Street, Brooklyn, N. Y.
Standard Computing Scale Co.: W. TOM WHITE, Assistant Supervisor, Sales Agencies, Detroit, Mich.
Streeter-Amet Co.: HARRY M. ROESER, Mechanical Engineer, 4101 Ravenswood Avenue, Chicago, Ill.
Tokheim Oil Tank and Pump Co.: GEORGE U. BRAKE, Sales Engineer, Fort Wayne, Ind.
Toledo Scale Co.:
S. Q. BENNETT, Manager, Service and Weights and Measures, Toledo, Ohio.
ELMER R. BATCHELDER, Factory Sales Engineer, 40 Broad Street, Boston, Mass.
H. O. HEM, Toledo, Ohio.
H. I. MAYCOCK, Toledo, Ohio.
V. V. RADIONOFF, 807 Rock Creek Church Road, Washington, D. C.

Digitized by Google

Viscote System, The: J. L. SCHATZMANN, Special Representative, Cincinnati, Ohio.
Wayne Co.:
CHARLES C. NEALE, Manager, Weights and Measures Division, Fort Wayne, Ind.
M. C. BROWN, 609 American Building, Baltimore, Md.
R. J. HEINEKAMP, 1000 Rhode Island Avenue NE., Washington, D. C.

GUESTS REPRESENTING TRADE AND ENGINEERING ASSOCIATIONS

American Petroleum Institute: DAVID V. STROOP, Secretary, Division of Marketing, 50 West Fiftieth Street, New York, N. Y.
Gasoline Pump Manufacturers Association: CHARLES C. NEALE, Fort Wayne, Ind.
National Scale Men's Association:
R. O. RASK, President, Bloomington, Ill.
M. J. J. HARRISON, Chairman, Committee on Method of Test of Motor-Truck Scales, Pennsylvania R. R., Altoona, Pa.
Underwriters' Laboratories: EARL J. SMITH, Engineer, Gases and Oils, 207 East Ohio Street, Chicago, Ill.

GUESTS REPRESENTING BUSINESS AND INDUSTRY

BOHART, JAMES G., Sinclair Refining Co., 630 Fifth Avenue, New York, N. Y.
HANNA, J. P., Sinclair Refining Co., 630 Fifth Avenue, New York, N. Y.
PAIGE, J. B., Scale Inspector, New York Produce Exchange, 2 Broadway, New York, N. Y.
SAYBOLT, J. W., Sales Manager, Standard Oil Co. of New Jersey, 26 Broadway, New York, N. Y.

GUESTS REPRESENTING RAILROADS

EPRIGHT, A. W., Supervisor Scales and Weighing, Pennsylvania Railroad, Altoona, Pa.
GOE, R. B., Supervisor, Weights and Inspection, Illinois Central System, Chicago, Ill.
HARRISON, M. J. J., Scale Inspector, Pennsylvania Railroad, Altoona, Pa.
HOSFORD, CHARLES C., Scale Inspector, Pennsylvania Railroad, 1114 Pennsylvania Station, Pittsburgh, Pa.
PHERIGO, J. L., Chief Scale Inspector, Southern Railway, Washington, D. C.
RASK, R. O., Scale Inspector, Alton Railroad Co., Bloomington, Ill.
SCHLINKERT, WALTER, Supervisor of Scales, Illinois Central System, Centralia, Ill.

GUESTS REPRESENTING GOVERNMENT DEPARTMENTS

KERR, R. H., Senior Chemist, Bureau of Animal Industry, United States Department of Agriculture, Washington, D. C.
MILLER, J. C., Skilled Draftsman, Post Office Department, Washington, D. C.
SPILMAN, H. A., Senior Marketing Specialist, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.

OTHER GUESTS

BEHAR, M. F., Editor, Instruments, 1117 Wolfendale Street, Pittsburgh, Pa.
BUCK, CARL J., Lieut. Commander (S. C.), United States Navy, Naval Powder Factory, Indian Head, Md.
JACOBS, EDITH G., Secretary, Scale Journal Publishing Co., 1703 East Eighty-fourth Street, Chicago, Ill.
WHITLEY, ROBERT J., 20 Norwood Avenue, Albany, N. Y.

Digitized by Google

CONTENTS

	Page
Officers and committees	III
Persons attending the Conference	V

FIRST SESSION—MORNING OF TUESDAY, JUNE 9, 1936

Opening remarks by the President, Dr. Lyman J. Briggs	1
Abstracts of State reports:	
Alabama, R. M. Johnson	1
Connecticut, C. L. Klocker	2
District of Columbia, George M. Roberts	2
Florida, Nalls Berryman	2
Georgia, S. H. Wilson	2
Illinois, John J. Levitt	2
Indiana, Martin L. Lang	3
Kentucky, William H. Ising, Jr	3
Maine, James A. Boyle	3
Maryland, S. T. Griffith	3
Massachusetts, John P. McBride	3
Michigan, John M. Daniels	4
Minnesota, Russell S. Ackerman	4
Missouri, Louis G. Waldman	4
New Hampshire, Walter G. White	4
New Jersey, Joseph G. Rogers	4
New York	5
North Carolina, C. D. Baucom	5
Ohio, J. C. Tinkey	5
Pennsylvania, C. J. P. Cullen	5
Rhode Island, Edward R. Fisher	5
Texas, W. S. Bussey	6
Vermont, H. N. Davis	6
Virginia, J. H. Meek	6
Washington, J. B. Fink	6
West Virginia	6
Wisconsin, William F. Steinel	7
Abstracts of reports of representatives of State associations of weights and measures officials:	
California Sealers' Association, Edward K. Strobridge	7
Illinois Weights and Measures Association, Vivienne Mannen	7
Indiana Association of Inspectors of Weights and Measures, Herbert G. Meyer	7
Maine State Sealers' Association, James A. Boyle	7
Massachusetts Association of Sealers of Weights and Measures, John R. Booth	8
Michigan Association of Weights and Measures Officials, Arthur J. Wilhelm	8
New Jersey Weights and Measures Association, John S. Burke	8
New York State Association of Sealers of Weights and Measures, C. P. Smith	8

SECOND SESSION—AFTERNOON OF TUESDAY, JUNE 9, 1936

Abstracts of reports of representatives of State associations of weights and measures officials—Continued:	
Ohio Sealers' Association, C. R. McFadden	9
Pennsylvania Association of Inspectors of Weights and Measures, C. J. P. Cullen	9
Virginia Weights and Measures Association, B. W. Ragland	9

Digitized by Google

The fee system of inspection of weights and measures, by George M. Roberts, superintendent of weights, measures, and markets, District of Columbia ... 9
Discussion of above paper ... 16
The problems of a local sealer in a State not having a State department of weights and measures, by Howard E. Crawford, inspector of weights and measures, city of Jacksonville, Fla ... 18
The training of public officials, by Harold I. Baumes, director, personnel training, League of Virginia Municipalities ... 22
The State aids in strengthening the local departments in Texas, by W. S. Bussey, chief, weights and measures division, department of agriculture, State of Texas ... 27
How are the benefits of State-wide inspection best to be secured? by J. H. Meek, director, division of markets, department of agriculture, State of Virginia ... 29
Proposed amendments to Model State Law on Weights and Measures ... 32

THIRD SESSION—MORNING OF WEDNESDAY, JUNE 10, 1936

The installation and maintenance of large-capacity scales, by Albert Veth, Fair Scale Co., Louisville, Ky ... 38
Recent activities of the National Scale Men's Association, by R. O. Rask, president, National Scale Men's Association ... 46
Testing equipments for large-capacity scales, methods employed, and results obtained:
Paper presented by Archie T. Smith, inspector, department of weights and measures, State of New Jersey ... 47
Paper presented by Matthew J. Diserio, deputy commissioner, department of public markets, weights, and measures, city of New York, N. Y ... 50
Paper presented by John J. Levitt, superintendent, division of standards, department of agriculture, State of Illinois ... 54
Discussion of above paper ... 57
Remarks of Edward K. Strobridge, sealer of weights and measures, county of Alameda, Calif ... 58
Paper presented by John M. Daniels, chief inspector of weights and measures, department of agriculture, State of Michigan ... 59
Appointment of committees ... 61
Announcements ... 61
Exhibition and demonstration of large-capacity scale-testing equipments ... 62

FOURTH SESSION—AFTERNOON OF WEDNESDAY, JUNE 10, 1936

Tour of the laboratories of the National Bureau of Standards ... 63

FIFTH SESSION—MORNING OF THURSDAY, JUNE 11, 1936

Demonstration of recent developments in weighing and measuring apparatus, by representatives of manufacturers ... 64
End testing versus corner testing for motor-truck scales, by M. J. J. Harrison, chairman, committee on method of test of motor-truck scales, National Scale Men's Association ... 64
National Scale Men's Association tentative definition of a standard test of a motor-truck scale (May 21st, 1935) ... 68
The National Bureau of Standards plan of cooperation with officials in relation to testing equipment for large-capacity scales ... 69
Address by Hon. Ernest G. Draper, Acting Secretary of Commerce ... 73
Drainage characteristics of dispensers for canned lubricating oil, by Ralph W. Smith, National Bureau of Standards ... 76
Discussion of above paper ... 81
Weights and measures administration in Great Britain, by R. J. Trump, Controller, Standards Department, Board of Trade of England ... 83
General consideration of subjects of interest and questions brought up for discussion by officials ... 90

SIXTH SESSION—AFTERNOON OF THURSDAY, JUNE 11, 1936

Proposed amendments to Model State Law on Weights and Measures—Continued ... 92

Digitized by Google

General consideration of subjects of interest and questions brought up for discussion by officials—Continued 98
Chicago ordinance in relation to vehicle-tank meters and the enforcement thereof, by James O'Keefe, inspector of weights and measures, city of Chicago, Ill 104
Air elimination for vehicle-tank meters, by C. D. Baucom, superintendent of weights and measures, State of North Carolina 106
Discussion of above paper 109
Portable testing equipments for large-capacity meters and vehicle-tank compartments:
Paper presented by Walter G. White, commissioner of weights and measures, State of New Hampshire 110
Paper presented by John R. Booth, sealer of weights and measures, city of Haverhill, Mass., and delegate from Massachusetts Sealers' Association 113

SEVENTH SESSION—MORNING OF FRIDAY, JUNE 12, 1936

Report of the Committee on Specifications and Tolerances, presented by F. S. Holbrook, chairman, and discussion thereon 117
Section on scales 117
Section on milk bottles 128
Section on liquid-measuring devices 130
Supervision over meats and meat products under the Federal Meat Inspection Act, by Robert H. Kerr, senior chemist, Bureau of Animal Industry, United States Department of Agriculture 132
Discussion of above paper 138
The regulation of utility meters, by P. L. Holland, chief engineer, public service commission, State of Maryland 145
Report of Committee on Constitution and Bylaws:
Majority report presented by C. D. Baucom, chairman 148
Minority report presented by James O'Keefe 150
Discussion of above report 151

EIGHTH SESSION—AFTERNOON OF FRIDAY, JUNE 12, 1936

Citation by officials of important court decisions in their jurisdictions 160
Report of Committee on Nominations, and election of officers 160
Report of Committee on Resolutions, presented by Walter G. White, chairman, and discussion thereon:
Research on air eliminators 161
Means for calibration of meters used as standards 161
Specification for manifolding systems on vehicle tanks 162
Appreciation to headquarters hotel and to exhibitors 162
Appreciation to the press and to the Scale Journal 162
Appreciation to Mr. R. J. Trump 163
Appreciation to exhibitors of equipments for the testing of large-capacity scales 163
Appreciation to cooperating officials 163
Appreciation to Director and staff of the National Bureau of Standards 163
Appreciation for reception tendered by North Carolina delegation 163
Authorization of a committee on publicity 164
Approval of merit system of appointment of officials 164
In memory of our departed members 164
Report of the treasurer, George F. Austin, Jr 165

Digitized by Google

Digitized by Google

REPORT OF THE TWENTY-SIXTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

HELD AT THE NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C., JUNE 9–12, 1936

FIRST SESSION—MORNING OF TUESDAY, JUNE 9, 1936

(The Conference was called to order at 11:05 a. m., by Dr. Lyman J. Briggs, President of the Conference.)

OPENING REMARKS BY THE PRESIDENT, DR. LYMAN J. BRIGGS

Gentlemen of the Conference, I appreciate very much this hearty welcome on your part, and in turn I wish to tell you with what deep satisfaction we welcome you at this, the Twenty-sixth National Conference on Weights and Measures.

It is particularly fitting that your meeting should be held at the National Bureau of Standards, for there is no other organization in the country with which the Bureau has closer contacts than this National Conference on Weights and Measures. The Conference is now attaining the dignity of years—this is your twenty-sixth meeting. But more important than the years themselves is the fact that they are marked with accomplishments.

I know of no more effective way of arriving at decisions and of accomplishing results than the procedure which you have adopted—the thorough discussion of your problems and the reaching of agreements through mutual understanding. This I take, in fact, to be the ideal and objective of your Conference.

We have a most interesting program before us, a program marked with some features of uniqueness. And so we shall proceed at once with the formal program and listen to the reports of the State officials.

ABSTRACTS OF STATE REPORTS[1]

ALABAMA

By R. M. JOHNSON, *Chief Inspector of Weights and Measures, Birmingham*

Speaking for his own city, Mr. Johnson reported that gasoline and bootleg coal were the two commodities which caused the greatest trouble from a weights and measures standpoint, the difficulties in this relation apparently being similar to those encountered in other jurisdictions.

[1] For convenience of reference, these reports have been arranged in alphabetical order throughout.

Digitized by Google

CONNECTICUT

By C. L. Klocker, *Inspector, Department of State Police*

Mr. Klocker reported the promulgation in his State of certain specifications adopted by the National Conference in 1935. He cited the adoption in Connecticut of a 2-percent tolerance for barrels for beer, and stated that these containers were still the source of some trouble in his State. Mr. Klocker was recently placed in direct charge of the enforcement of the State weights and measures laws.

DISTRICT OF COLUMBIA

By George M. Roberts, *Superintendent of Weights, Measures, and Markets*

Mr. Roberts reported that during the past year the appropriation for his department had been increased, permitting a 50-percent increase in his inspectional force. Reorganization was under way to place the work of the department upon a more efficient basis. On behalf of the District of Columbia, Mr. Roberts welcomed the Conference delegates to Washington.

FLORIDA

By Nalls Berryman, *Assistant State Chemist*

Mr. Berryman reported that there had been no changes in State weights and measures activity, the department of agriculture continuing to test only gasoline-measuring devices and to check on package goods. A general weights and measures bill was introduced at the last legislative session, but this was considered by the commissioner to have been poorly drawn, and he was instrumental in its defeat. A determined effort will be made at the next session of the legislature to secure passage of a bill patterned after the Model State Law adopted by the Conference.

GEORGIA

By S. H. Wilson, *State Oil Chemist*

Mr. Wilson reported that there was no new weights and measures legislation in his State, but that his office was still carrying on the testing of gasoline-measuring devices. Plans for the enactment of a comprehensive statute providing for State-wide weights and measures supervision had not been abandoned, and eventual success in this endeavor was anticipated.

ILLINOIS

By John J. Levitt, *State Superintendent of Standards*

Mr. Levitt commented briefly upon the progress being made by his division and mentioned the special equipment, just acquired, for the testing of large-capacity scales, which he was to discuss in greater detail on the following day; in this connection he voiced his appreciation of the assistance in developing the details of this equipment, rendered during the past year by members of the National Bureau of Standards staff.

Digitized by Google

INDIANA

By MARTIN L. LANG, *State Commissioner of Weights and Measures*

Mr. Lang confined his remarks to an expression of appreciation of the cooperation and assistance extended to his department along many lines by the weights and measures officials of the various States and by the National Bureau of Standards. He mentioned particularly his gratification over the continuing activity of the National Conference on Weights and Measures.

KENTUCKY

By WILLIAM H. ISING, Jr., *Chief Inspector of Weights and Measures, Louisville*

Mr. Ising, speaking of conditions in his city, said that the bootleg-coal situation was being brought under control through a plan of cooperation between his department and the local police department. Obsolete types of gasoline pumps had caused considerable trouble, but these were rapidly being replaced by modern equipment. He noted the inadequacy of his present inspectional force but hoped that an increase would shortly be granted.

MAINE

By JAMES A. BOYLE, *Sealer of Weights and Measures, Portland*

Mr. Boyle discussed extensive investigations carried on in several large bakeries of his city relative to the shrinkage of bread prior to wrapping. He also mentioned several successful prosecutions in cases where paper and trays were being charged for at commodity prices, and noted the withdrawal from the market of a large quantity of packaged clothes line which was found to be 10 percent short of its marked length.

MARYLAND

By S. T. GRIFFITH, *Chief, Bureau of Weights and Measures, Baltimore*

Mr. Griffith reported that there had been no change during the past year in the weights and measures organization of his State. The city of Baltimore continued to maintain active weights and measures supervision, and there were a few counties carrying on some inspectional work; there was, however, no general State activity in this field.

MASSACHUSETTS

By JOHN P. MCBRIDE, *Director, State Division of Standards*

Mr. McBride reported that his organization had been especially active during the year with respect to tank-truck meter systems, and that these studies were still being carried on. He spoke of a current investigation on log rules and calipers and asked to be supplied with any information which other officials might have along this line. Successful enforcement was reported of a new law requiring that retail sales of meat and poultry be made on a weight basis only and not by the piece.

Digitized by Google

MICHIGAN

By JOHN M. DANIELS, *Chief State Inspector of Weights and Measures*

Mr. Daniels stated that the outstanding problem of his division during the year had been irregularity in the standards for packages of flour; progress had been made in effecting standardization, but the situation was not yet entirely cleared up. Mr. Daniels noted the procurement by his State of a special equipment for testing large-capacity scales, about which he was to speak in detail on the following day.

MINNESOTA

By RUSSELL S. ACKERMAN, *Superintendent, Department of Licenses, Weights, and Measures, Minneapolis*

Mr. Ackerman stated that the checking of deliveries of fuel oil for domestic heating plants was a problem of increasing importance in his city, and requested information from officials of other jurisdictions as to how such deliveries could adequately be checked.

MISSOURI

By LOUIS G. WALDMAN, *Commissioner of Weights and Measures, St. Louis*

Mr. Waldman reported that recently a number of the smaller municipalities of his State had established weights and measures supervision, and gave it as his opinion that as this movement continues, it will eventually bring about the creation of a State weights and measures department.

NEW HAMPSHIRE

By WALTER G. WHITE, *State Commissioner of Weights and Measures*

Mr. White outlined the plan which he had developed for keeping all of the weights and measures officials of the State informed as to what the others are doing. The State office acts as a clearing house for the distribution of essential data and maintains complete files, including "case histories" of individuals engaged in commercial pursuits in the State, and individual records of apparatus which is rejected and which may be reconditioned and resold. Numerous forms used in this connection were exhibited.

NEW JERSEY

By JOSEPH G. ROGERS, *Assistant State Superintendent of Weights and Measures*

Mr. Rogers presented a comprehensive report of the activities of his department, mentioning particularly prosecutions, package reweighing, type approval of commercial equipment, drugstore testing, bootleg coal, certified weighmasters, liquid-measuring devices, tank trucks, net-content marking of packages, beverage bottles, beer barrels, packaged meats, lumber, textiles, and certain short-weight interstate shipments of mushrooms and potatoes. Two amendments of the weights and measures statutes were reported, suggestions were made for additional legislation, and the addition of eight solid-fuel inspectors was noted.

Digitized by Google

NEW YORK

(The State of New York was represented by a number of city and county officials. An invitation was extended by the chairman for one of these officials to speak for the State, but no report was presented.)

NORTH CAROLINA

By C. D. BAUCOM, *State Superintendent of Weights and Measures*

Mr. Baucom reported a 100-percent increase in the appropriation for his office and a corresponding increase in his inspectional force. He stated that the percentages of correct and incorrect apparatus were remaining about constant, but noted an increase in the number of prosecutions for weights and measures violations. Transport trucking of petroleum products in vehicle tanks carrying 4,000-gallon loads had created an unusual testing problem and necessitated the construction of loading platforms which were accurately level. More vigorous steps were to be taken to insure submission for approval of new types of weighing and measuring devices.

OHIO

By J. C. TINKEY, *Deputy State Sealer*, and O. E. BRENNEMAN, *Chief Deputy Sealer of Weights and Measures*

Mr. Tinkey reported upon the activities of the past year, mentioning total inspections made, some changes in specification requirements, and certain publications issued. He noted that about one-half of the local sealers were new appointees, necessitating special training efforts by the State, and commented upon a new coal law being enforced jointly by weights and measures officers and regular police officers. In announcing that weights and measures work in Ohio had recently been given a separate bureau status in the department of agriculture, Mr. Tinkey introduced the new bureau chief, O. E. Brenneman, who spoke briefly, conveying to the Conference the greetings of his State.

PENNSYLVANIA

By C. J. P. CULLEN, *Director, State Bureau of Standard Weights and Measures*

Mr. Cullen discussed the development of the problem of bootleg coal at the Pennsylvania mines, the efforts made to control the situation, the collateral problem of overloaded trucks on the State highways, a drive on mine tipple scales many of which had been seriously inaccurate, investigations of short weighing in the packing of mushrooms, and the testing of beer barrels. He reported that two large equipments were being secured for the testing of motor-truck scales; also that his inspectional force had been increased somewhat during the past year.

RHODE ISLAND

By EDWARD R. FISHER, *State Sealer of Weights, Measures, and Balances*

Mr. Fisher extended to the Conference the greetings of the 39 local sealers of his State. He stated that he was particularly anxious to secure information relative to small meters which could be attached to fuel-oil burner installations to measure the consumption of oil.

Digitized by Google

TEXAS

By W. S. Bussey, *Chief, State Division of Weights and Measures*

Mr. Bussey reported that his division was operating five fixed-location vehicle-tank testing stations in the State in cooperation with the controller's department; during the past 2 years 5,400 tanks had been tested. Among the special activities of the division, he mentioned supervision of cotton weights involving the annual re-weighing of about 15,000 bales of cotton, original weighing of all "prison-system" cotton, supervision over the butter-fat determinations for all milk and cream sold in the State, and the inspection of gas, water, and electricity meters.

(At the conclusion of his report, Mr. Bussey extended a general invitation to the members of the Conference to attend the Texas Centennial celebrations, and on behalf of Governor James V. Allred, of Texas, presented to Doctor Briggs, President of the Conference, a commission as honorary Texas Ranger and, as a badge of office, a ranger's "ten-gallon" hat.)

VERMONT

By H. N. Davis, *Deputy State Commissioner of Weights and Measures*

Mr. Davis announced that bootleg coal had become a problem in his State, truckers of marble and granite out of the State returning from the coal fields with loads of coal; he discussed the provisions of a recently enacted statute designed to control the situation, but stated that it was not entirely successful. Mr. Davis reported a recent regulation requiring poultry to be sold by weight, noted the satisfactory operation of his equipment for testing vehicle-tank meters and compartments, and discussed briefly the matter of bottles for malt beverages.

VIRGINIA

By J. H. Meek, *Director, State Division of Markets*

Mr. Meek reported that weights and measures supervision in his State had been extended and improved during the past years; details along this line would be discussed in his paper later in the day. He spoke of the weights and measures training school for local officials inaugurated during the past year under the sponsorship of the League of Virginia Municipalities, in connection with which the Virginia Weights and Measures Association was revived.

WASHINGTON

By J. B. Fink, *Assistant Director, State Department of Agriculture*

Mr. Fink outlined the weights and measures organization of the State and described briefly the equipment and general plan of operation of the field inspectors. He pointed out that appropriations were sufficient to provide only four field inspectors, a force inadequate to handle the work properly in the territory covered by the State division, including as this does, the entire State with the exception of the cities of Seattle, Spokane, and Tacoma, which have city sealers.

WEST VIRGINIA

(West Virginia was represented at the Conference, but although a report was called for on several occasions, none was made.)

Digitized by Google

WISCONSIN

By WILLIAM F. STEINEL, *Sealer of Weights and Measures, Milwaukee*

Mr. Steinel reported that it was because of a limited budget that George Warner, chief State inspector of weights and measures, was unable to be in attendance at the Conference. Speaking of his own city, Mr. Steinel reported that the work was being carried on very satisfactorily.

ABSTRACTS OF REPORTS OF REPRESENTATIVES OF STATE ASSOCIATIONS OF WEIGHTS AND MEASURES OFFICIALS[3]

CALIFORNIA SEALERS' ASSOCIATION

By EDWARD K. STROBRIDGE, *Sealer of Weights and Measures, Alameda County*

Mr. Strobridge, president of the association, reported the formation of the association at the time of the State conference held in Los Angeles in October 1935. He stated that a committee on civil service had been appointed and was actively engaged in preparations to secure the passage of legislation placing all local weights and measures officials of the State under civil service. The next meeting of the association will be held in Fresno in October.

ILLINOIS WEIGHTS AND MEASURES ASSOCIATION

By VIVIENNE MANNEN, *Secretary, State Division of Standards*

Miss Mannen, secretary of the association, reported that at the last meeting of the association, held at Springfield in January 1936, there was appointed a legislative committee to study the State weights and measures law and recommend needed amendments for presentation to the 1937 legislature.

INDIANA ASSOCIATION OF INSPECTORS OF WEIGHTS AND MEASURES

By HERBERT G. MEYER, *State Inspector of Weights and Measures*

Mr. Meyer, secretary of the association, reported that an excellent 3-day meeting of the association was held in Muncie in April 1936. He stated that one of the outstanding principles of the association was the education of the public to a proper understanding of weights and measures supervision as an aid in law enforcement. He presented the regrets of the president of the association, Mr. Rollin E. Meek, at his inability to attend the National Conference because of illness in his family.

MAINE STATE SEALERS' ASSOCIATION

By JAMES A. BOYLE, *Sealer of Weights and Measures, Portland*

Mr. Boyle reported that no meeting of the association was held last year because of the temporary vacancy in the office of deputy State sealer. Plans were under way, however, to resume regular meetings of the association.

---

[3] For convenience of reference these reports have been arranged in alphabetical order.

Digitized by Google

MASSACHUSETTS ASSOCIATION OF SEALERS OF WEIGHTS AND MEASURES

By JOHN R. BOOTH, *Sealer of Weights and Measures, Haverhill*

Mr. Booth, official delegate from the association to the National Conference, spoke of the close cooperation existing between the association and the State division of standards, which was particularly effective in the matter of weights and measures legislation. He mentioned an amendment which had been secured during the year to the statute regulating peddlers, and discussed the program to extend civil-service protection to sealers in towns of 5,000 or more population.

MICHIGAN ASSOCIATION OF WEIGHTS AND MEASURES OFFICIALS

By ARTHUR J. WILHELM, *Sealer of Weights and Measures, Hamtramck*

Mr. Wilhelm announced the dates for the coming meeting of the association—August 31 and September 1 and 2—to be held in Battle Creek, and extended to the members of the National Conference a general invitation to attend.

NEW JERSEY WEIGHTS AND MEASURES ASSOCIATION

By JOHN S. BURKE, *Municipal Superintendent of Weights and Measures, Jersey City*

Mr. Burke, president of the association, noted the large number of association members in attendance at the National Conference. He referred to the comprehensive State report presented by Mr. Rogers as serving adequately to cover weights and measures activities in New Jersey during the past year.

NEW YORK STATE ASSOCIATION OF SEALERS OF WEIGHTS AND MEASURES

By C. P. SMITH, *Sealer of Weights and Measures, Suffolk County*

Mr. Smith, president of the association, reported the passage of an amendment to the bread law, sponsored by the association, bringing seed-covered bread within the weight provisions of the law. He also discussed in some detail a new law designed to control the bootleg-coal situation through provisions for "certificates of origin", weighing by licensed New York weighmasters, special markings on the hauling trucks, and other requirements. Mr. Smith announced the next meeting of the association to be held in Rochester in July.

(At this point, at 1:00 p. m., the Conference took a recess until 2 p. m.)

Digitized by Google

SECOND SESSION—AFTERNOON OF TUESDAY, JUNE 9, 1936

(The Conference reassembled at 2:22 p. m., at the National Bureau of Standards, Dr. Lyman J. Briggs, President of the Conference, in the chair.)

ABSTRACTS OF REPORTS OF REPRESENTATIVES OF STATE ASSOCIATIONS OF WEIGHTS AND MEASURES OFFICIALS—Continued

OHIO SEALERS' ASSOCIATION

By C. R. McFADDEN, *Deputy Sealer of Weights and Measures, Licking County*

Mr. McFadden outlined the weights and measures organization in Ohio, described the sectional meetings of the association, and announced that the annual meeting of the association would be held in Columbus on December 1, 2, and 3. He stated that the weights and measures laws of the State were in need of revision, and that the association was continuing its efforts, unsuccessfully up to the present time, to bring this about.

PENNSYLVANIA ASSOCIATION OF INSPECTORS OF WEIGHTS AND MEASURES

By C. J. P. CULLEN, *Chief, State Bureau of Standard Weights and Measures*

Mr. Cullen reported that because of the economic situation which had prevailed for the past several years, the association had recently been inactive, but that plans were being made to resume the annual meetings, with tentative arrangements already made to hold this year's meeting in August.

VIRGINIA WEIGHTS AND MEASURES ASSOCIATION

By B. W. RAGLAND, *Chief, Bureau of Weights and Measures, Richmond*

Mr. Ragland, one of the vice presidents of the association, described the revival of the association at a meeting held in Richmond in 1935 under the sponsorship of the State division of markets and the League of Virginia Municipalities. This meeting partook of the nature of a training school for weights and measures officials, and this idea will be continued in the 1936 meeting scheduled to be held at Winchester in September.

THE FEE SYSTEM OF INSPECTION OF WEIGHTS AND MEASURES

By GEORGE M. ROBERTS, *Superintendent of Weights, Measures, and Markets, District of Columbia*

Dr. Briggs, ladies, and gentlemen, I want to say, at the beginning, that throughout this paper I will make considerable reference to my experiences here in the District of Columbia. I do not want anyone to feel that this is done for the purpose of attracting attention to the work of my department. However, I feel that in discussing a

Digitized by Google

subject of this kind I can better drive my points home by referring to specific incidents.

I was recently amazed to learn that in some localities where the old system of charging and collecting fees for making inspections of weighing and measuring instruments had been outlawed, there has been manifested an inclination to try to have laws enacted providing for a return to that system.

Law making officials, looking about for places to raise small amounts of revenue, may, without investigation, listen to such suggestions. It is my opinion that investigation will disclose that such suggestions usually originate with unscrupulous merchants who desire to cripple the work of weights and measures departments and prevent a proper enforcement of weights and measures laws. It will probably be found that considerable numbers of well meaning persons who still believe that scale testing constitutes the entire work of a weights and measures department may be induced through insidious propaganda to favor the proposal to restore an obnoxious fee system.

It is the duty of weights and measures officials wherever the movement to restore the fee system is on foot to turn the light of publicity toward the broad functions of a weights and measures department in order that the public generally, and lawmakers in particular, may become informed of the disastrous results which are reasonably sure to follow if this plan to cripple their work is successful.

I think it may be safely asserted that if the general public and members of legislative bodies are fully informed there will be little or no danger of a movement of the kind described attaining any success whatever. Lawmakers generally desire to serve the public interests. Wherever they are found to favor a return to the fee system, it is probably because they have been deceived.

Weights and measures officials are probably largely to blame in any instances where advocacy of the system has gained headway. Far too much stress has been placed upon the work of testing equipment and far too little stress has been placed upon other and more important functions of weights and measures administration.

When I became Superintendent of Weights and Measures for the District of Columbia nearly 20 years ago, the law here provided for the collection of fees. It was later repealed, and a new law which abolished the fee system and was an improvement in many other respects was enacted by Congress. I have had experience, therefore, with laws of both characters, and I feel that I can speak with some authority on the subject.

The fee system is objectionable on so many grounds that time will not permit enumerating all of them. I shall mention only a few.

First, such a system obviously creates temptation for petty graft. I know of no place where weights and measures inspectors are paid salaries commensurate with the duties and responsibilities of their positions. Now, it is morally wrong and contrary to sound public policy to subject a poorly paid public employee like an inspector of weights and measures to the temptations which beset him on every hand by requiring him to charge, collect, and account for small fees from every merchant whose place of business he inspects. Weights and measures inspectors, after all, are only human and some of

Digitized by Google

them would doubtless give way to temptation under such circumstances.

Second, where a tax in the form of fees is laid against the owner of every store, or other business establishment, every time an inspection is made of the weighing and measuring instruments used by such proprietor in his business, resentment is immediately created even among the best business men, and there is aroused a spirit of enmity and obstruction instead of a feeling of friendliness. In many instances scales and measures will be secreted in order to avoid paying fees which the merchant knows he should not be required to pay, and the supervision over weighing and measuring instruments, therefore, becomes to some extent, at least, a farce.

Third, the principle of requiring the merchant to pay for such inspection service is wrong because inspections are made, not for his benefit, but for the benefit of his customers and the general public. Therefore, payment for the work should unquestionably be made from general revenues raised by general taxation. There would be just as much sense in having a health department charge the owner of a business a fee every time a health inspector looks his place over to ascertain whether or not such owner is complying with health laws, or in having a policeman charge and collect a fee from a citizen who called upon the police to stop a disturbance or a fight in front of his house, or in having the fire department charge a fee to cover the cost of putting out a fire.

Fourth, another and to my mind the chief objection to a requirement for collection of fees for testing weighing and measuring instruments lies in the fact that after such a system is established, a weights and measures department will be expected to expend less for its work than the amount it collects in fees. In other words, the intention will be to make the department not only self-sustaining but a producer of revenue. The result will obviously be a curtailment of the most important functions of the department, and, in some instances, practically an abandonment of such functions.

The prime duty of a weights and measures department, broadly speaking, is to maintain fair and honest competition among merchants both wholesale and retail and to protect consumers and other buyers of all commodities against deception and fraud.

In the performance of these broad duties, the testing of scales and measures is merely the first step. Comprehensive investigations are necessary to uncover the methods of those who cheat and to punish offenders against the numerous prohibitions contained in most weights and measures laws. If the activities of a department are curtailed to such an extent that it must be sustained by fees it collects, there will be little opportunity to stop the many forms of swindling now employed throughout the country.

Any situation whereby a department could expend no more than the amount it collects in fees would undoubtedly retard and in some instances completely destroy much effective work because a sufficient inspection force cannot possibly be maintained if expenses are limited to the amount of fees collected for testing weighing and measuring instruments. A situation of that kind would undoubtedly operate against the public interest and in the interest of dishonest trade

Digitized by Google

practices. If fees are charged for one kind of work, fees should be charged for other kinds of work.

Let us consider the logical conclusion to which a so-called fee collecting system leads. Shall consumers be charged a fee for the investigation of complaints which they may make? To whom should be charged the expense of conducting comprehensive investigations which are necessary to prevent the cheating of consumers and to sustain honest competition? The dishonest merchant would, of course, like to see such investigations stop. They could then pursue their unlawful practices without hindrance.

Here in the District of Columbia we have a very comprehensive weights and measures law. Of course it provides for semiannual tests for weighing and measuring instruments. As previously stated, that is merely the first step in enforcement of other provisions of the law. Provisions of similar character are contained in the laws of most of the States. Therefore, what I say about the District of Columbia applies with equal force to other localities.

The District of Columbia law prohibits the manufacture or sale of loaves of bread of other than certain definite weights. There are about 250,000 loaves of bread baked and sold daily in the District of Columbia, and it is the duty of the weights and measures department to see that the law relating to bread is enforced. In order to do that, it is necessary to weigh loaves of bread every day in retail stores, and to make periodical visits to the bakeries for the same purpose. It would be worse than nonsense to charge a merchant or a baker a fee for investigating the weights of his bread. That work is for the protection of consumers. And if a consumer reports that the bread he buys is short weight, should he be told that he must pay a fee to have it investigated? Our law provides that ice shall be sold by weight, and it is our duty to see that the law is carried out insofar as we can do so. If a consumer of ice makes a complaint regarding his iceman, should we be compelled to say to him that he must pay a fee before an investigation is made? The law prohibits the sale of oysters containing more than ten percent of liquid. If a consumer reports that his oyster dealer is selling more liquid in his oysters than the law allows, should such a consumer be informed that his complaint will be investigated provided he pays a fee?

The law also provides that fruit and vegetable containers shall be compactly filled, and shall be of certain prescribed sizes. When a retail merchant complains that the baskets and boxes of fruits and vegetables he receives from a wholesaler are of illegal size or slack filled, should he be required to pay a fee to have the swindle stopped? If a consumer of coal, of meats, of milk, of groceries, of yard goods, or any of the many other commodities which are purchased daily, makes complaint to the effect that the dealer from whom he buys is delivering short weight or short measure, should such consumer be told that he must continue to be swindled unless he is willing to pay the expense of an investigation? If the owner of an automobile reports that the filling stations are delivering short measure of gasoline, should the weights and measures department be required to inform him that he must pay for having the matter investigated?

I could state many additional propositions of similar character but the foregoing are sufficient to show the utter absurdities to which a fee system leads us if pursued to its logical end.

Digitized by Google

The fact that the scales used by a merchant have been tested and found correct is no proof that he delivers correct weight to his customers. Neither does the fact that gasoline pumps have been inspected and found correct prove that the gasoline dealer delivers full measure. Notwithstanding the truth of these statements, we still find supposedly intelligent people, some of them government officials, who believe that a merchant whose scales are correct always delivers full weight, and that the gasoline dealer whose pumps can be operated correctly always delivers full measure of gasoline. They also believe that if yardsticks are 36 inches long, a merchant cannot deliver short measure of yard goods.

My experience has been that the food dealer who cheats most is usually careful to have his scales correct. In order to deliver short weight he resorts to other methods and tricks; he is so foolish that he thinks if his scales are correct, that fact will assist him in defending himself in court should he be tried for selling short weight. The same is true of gasoline dealers who cheat by short measure. They have their pumps correct, foolishly believing that fact will help them when placed on trial for selling short measure.

Testing scales and measures is merely the beginning of the work of a weights and measures department. As stated, it is a function upon which entirely too much stress is placed by weights and measures officials.

The chief duty of a properly conducted weights and measures department is to make investigations and bring swindlers to justice for the benefit of consumers generally and for the protection of honestly conducted business against unscrupulous competition. The latter feature is often overlooked in discussing the subject of weights and measures. Nevertheless, one of the most important functions of a weights and measures department is to maintain fair competition. It is not unusual for me to receive complaint from a merchant regarding what he considers unfair competition to which he is being subjected in violation of the weights and measures law. I am now starting two very comprehensive investigations as a result of such complaints, which may require months to complete. Should the business man who believes he is being injured be required to pay the cost of the investigations? The question answers itself most positively in the negative. The injured party is entitled to protection which the law affords him without having to pay a fee for obtaining such protection.

Last year I conducted investigations of certain retail stores in Washington in regard to the sale of meats. Scales used in all of them were correct, but when I sent undercover buyers into the stores to make purchases, here are a few of the weights they received:

Store 1.—Shoulder, short weight 14 ounces; beef roast, short weight 1 pound, 1 ounce; ham, short weight 10 ounces; beef roast, short weight 4 ounces.

Store 2.—Smoked shoulder, short weight 1 pound, 2 ounces; lard, short weight 3 ounces; shoulder, short weight 5 ounces; beef roast, short weight 14 ounces; shoulder, short weight 4 ounces.

Store 3.—Smoked shoulder, short weight 12 ounces; corned shoulder, short weight 9 ounces; fresh shoulder, short weight 13 ounces; beef roast, short weight 1 pound, 2 ounces; fresh shoulder, short weight 10 ounces.

Store 4.—Smoked shoulder, short weight 11 ounces; roast beef, short weight 7 ounces; smoked shoulder, short weight 9 ounces.

Digitized by Google

Another investigation which I conducted was of sales of gasoline by a large corporation operating more than 60 filling stations in Washington. Its pumps had been inspected and found correct, but notwithstanding that fact, my undercover buyers received short measure on a large number of purchases of 5 gallons each. The short measure ranged from a few ounces to 2 gallons per purchase, and according to the best available information in regard to the quantity of gasoline sold per year in Washington by the corporation in question, purchasers of gasoline were being defrauded of more than $100,000 per year by this concern alone. Prompt prosecution caused it to change its methods of doing business in this city. In connection with this investigation, it was necessary to go into the details of how the business of the corporation was being conducted in order to trace the blame for the fraud to the management, where it was found to belong.

Some months ago I directed an investigation relating to sales of dressed poultry in Washington by one of the large national chain store systems. Here, again, it was necessary through long and painstaking investigation to ascertain where the blame might be properly placed. It was necessary to obtain information relating to the inside operations of the concern with respect to requirements forced upon the managers of and clerks in its various stores, and to carefully study what effect such methods as it pursued were likely to have on the question of whether owners of the corporation were to blame for shortweight sales made by its clerks, and whether its methods were calculated to induce its employees to cheat customers.

In passing, it is not out of place to say that out of 81 purchases made by my undercover buyers in stores of this chain system situated in various parts of the city of Washington, only 13 were of correct weight. None were over weight, and 68 were short weight. Some of the short weights were small, but some of them amounted to more than a pound on a dressed chicken. After eliminating all the small short weights, 24 prosecutions were instituted against the corporation charging sales by short weight. An array of the most resourceful lawyers obtainable are engaged in the defense. Two cases have been tried. In one case the corporation was acquitted by a jury; in the second case the corporation was convicted. Its lawyers are now resorting to all the legal quibbles cunning can devise to prevent the remaining 22 cases from coming to trial.

The foregoing facts have been related to make plain the futility of undertaking administration of the weights and measures law by any department dependent upon the amount of fees it collects for expenses of operation. What is true of the District of Columbia is, I take it, true of other localities. I have simply referred to what has taken place here as a matter of illustration.

The cases discussed are only a few of the many investigations conducted. None of them could have been made if the District of Columbia Department of Weights and Measures had employed only the number of inspectors it could have paid from the proceeds of fees collected for testing scales and other devices. Had that been the situation the concerns named and many others would still be carrying on the same sort of fraud they have perpetrated in the past, and consumers would still be suffering accordingly.

Digitized by Google

The fee system is inherently vile in principle. It should be opposed by weights and measures officials and by honest people everywhere. It is inconceivable that after studying the subject any legislative body will for a moment consider voting for the return of a system which has long been generally discredited, which is in its essence pernicious, and which by its very nature is calculated to cause dishonesty, fraud, and graft.

In every State, in every city, in every community, where a return to such a system is advocated, consumers, merchants, and others who desire to have business conducted honestly and according to high standards, who desire to be rid of fraud and of unfair and unscrupulous competition, should unite for the purpose of disseminating accurate information in regard to the subject, and should see to it that such information is placed in the hands of every legislative official. They should not remain idle while thoughtless or unscrupulous persons spread propaganda in favor of a return to any such system. In this work, weights and measures officials should take the initiative. The public generally needs to be informed regarding the valuable public service you are rendering. An informed public will invariably support you. If it can be shown that a department saves money for consumers in the purchase of necessities, public support will be forthcoming.

It is rather surprising to learn the number of people who are not informed on this subject even in localities having weights and measures departments. For instance, within the present year I received a letter from a woman in New Jersey expressing the wish that they had a weights and measures department in that State. Now all of us know that the New Jersey department is one of the most active in the country. I may add that some time ago a lady came into my department to make a complaint. She had asked somebody as to whom to consult and they had referred her to me. That was the first time that the department had come to her attention.

Let me repeat here as emphatically as I can that I have no sympathy with loose talk indulged in by some irresponsible persons to the effect that lawmakers, as a rule, fail to look to the public welfare in performance of their legislative duties when fully informed upon any subject under consideration by them. I hope that I shall be pardoned for relating some personal experiences at this point solely for the purpose of driving home, if I can, my views on this subject.

During the many years I have been in charge of the Department of Weights and Measures of the District of Columbia, it has been my duty and pleasure to come in contact in my official capacity with many members of Congress. Whenever I have laid my case before the various committees of the House and the Senate, fortified by facts to uphold my contentions, I have always obtained wholehearted response to the public needs. When I took charge of the department, the old weights and measures law then in effect lacked much of being what was needed to protect the public against fraud and to maintain fair competition in business. After I became well acquainted with the situation and saw how the law needed revision, a bill was prepared, and introduced in Congress, proposing a new law on the subject of standard weights and measures for the District of Columbia. When I went before the committees of Congress,

Digitized by Google

explained its provisions, and the need for a new law, I found members of both the House and Senate ready and willing to pass the bill which I proposed. Of course, I was prepared to present facts. I realized that the man who is prepared is the man who wins his case. Again last year when it became known to members of the Senate and House Committees on Appropriations that I needed a larger force to properly carry on the work required by law, there was no hesitancy about increasing my inspection force by more than fifty percent. This was done notwithstanding the fact that, generally speaking, members of both House and Senate were at that time very reluctant to authorize new positions in Government departments.

Credit for presenting to Congress the facts regarding the desperate need for an increased inspection force is due largely to the active chairman of our local consumers council, who did very fine work.

The things most necessary to attain success in presenting a proposal to any legislative body are, first, to be convinced yourself of its merit; second, to marshal the facts in a way to present your case fully, fairly, and forcefully; third, to be able to show that what you propose is in the general public interest. When such a course is followed, favorable action is almost inevitable. However, unless one presents his case well there is little ground for expecting favorable action.

When the District of Columbia law which is now in effect was being considered in the House of Representatives, an amendment was offered to require collection of fees, but only 6 out of 435 members of the House voted for its adoption.

Wherever return to the fee system is proposed, the thing to do is to fight it on principle and with facts. Enlist the aid of consumers and of honest business men by presenting the facts to them, and asking their help. That is the way, in my opinion, to kill any such iniquitous proposition. Never surrender and never compromise. There is no ground upon which may properly be based a compromise on a question involving right and wrong.

DISCUSSION OF ABOVE PAPER

The CHAIRMAN. Is there discussion of this interesting paper by Mr. Roberts?

Mr. ROGERS. I consider that a very splendid paper on a very timely subject. There is undoubtedly a trend back to the fee system. There was quite a furor caused in New Jersey recently by an attempt of a newly created financial department to suggest that much of the work that we were doing really should be charged to the persons who benefit by it. It was, we will say, rather an astounding move, because we had not fostered it ourselves in our department and had always argued just as Mr. Roberts argues in his paper.

I think that this subject is so up to the minute now that if possible Mr. Roberts, through the District authorities, should have that paper prepared and it should be distributed, so that we can get copies of it, because I think he has cited all the arguments, practically, that can be made against the fee system. We know the viciousness of it, and the only reason that I can see now why there is a tendency on the part of State governments to go back to it is to make up revenues

Digitized by Google

that must be gotten somehow to take care of relief projects. I believe that is the situation around the country. It was natural to assume that this weights and measures angle would be considered in this connection. I think that we cannot be too well informed, that we cannot have too much material in our hands to place before our legislators, if these things are going to be proposed in our State jurisdictions.

I appreciated that humorous incident that you cited, Mr. Roberts. I think that is an experience a lot of us may have. People sometimes just don't know what is being done to protect them along weights and measures lines.

When you speak of educating the public, it is sometimes a difficult matter, through the medium of the newspapers, to do that. Weights and measures are being treated more or less today as a trite subject. They take the attitude, "We have dealt with that and have disposed of it." They know all about it. They dislike to publish the things we do. I have prepared articles two or three pages in length, only to be given three or four lines on the fourth or fifth page, down in the corner. Of course that isn't conducive to encouraging people to try to educate the public through those channels.

We have turned to the speakers' platform, and as I said in my paper this morning, a number of our men are taking speaking courses. These fellows are going out and doing a splendid job. They are going into the schools—there is the fundamental place to take up the educational projects, because the boy and girl of today are the breadwinners of tomorrow. There is the place to start off.

We notice there is a very healthy respect on the part of the parent-teacher associations. They like to have speakers. Civic clubs are going in for it. If we are going to lose the medium of the newspapers to spread our propaganda, as we call it, we have still the spoken word, and sometimes we have had the experience of being asked to broadcast on courtesy programs.

Mr. CAHILL. Four years ago there was a bill introduced in the State of New York providing for charging fees. Our State officials who knew the evils of the fee system went out to defeat that. One of our local sealers wrote a very able paper on this subject. I took that paper and spent about a week in Albany, and consequently the bill didn't come out of the committee. We sealers were very much pleased that we, as a body, could defeat that bill, which we knew was bad.

Mr. BAUCOM. I move that this paper be mimeographed and copies distributed at the expense of the Conference.

Mr. HOLBROOK. Of course, this paper will be printed in the Conference report. However, if there is a real need for putting this paper in your hands before the report is issued, I don't believe it will be necessary to spend Conference funds to do it. I think we will be able to take care of it in the Bureau as a matter of course.

The 1935 Conference report, as you all know, was very much delayed. We expect to get it out very much earlier this year. It will probably be out before the first of the year; I think perhaps by the first of December. Are there enough legislative sessions at which fee systems are likely to be proposed, before the first of December, to justify doing this work? If you have this paper in

Digitized by Google

printed form as part of the proceedings of this organization, I think it will be given more attention and respect by legislators than if it is in mimeographed form.

Mr. O'KEEFE. Is it the sense of this meeting that this Conference go on record as opposed to the fee system, and that we are voting on that as a whole? We have a fee system in Chicago and I would hate to leave Washington and have every member of this Conference think that there was graft and so forth attached to the fee system, because I am here to tell you that so far as the city of Chicago is concerned we have a very fine, clean department. I have 41 inspectors and I don't think one of my men, as I know them, could be accused of graft.

I am not taking that personally, from that report. I am not going to go on record here as voting against the fee system, because we must have it in Chicago. We have a city of 3,500,000 people, and we have no other means of raising revenue for that particular purpose.

The CHAIRMAN. There has been no motion proposed, sir, as putting the Conference on record in the matter.

THE PROBLEMS OF A LOCAL SEALER IN A STATE NOT HAVING A STATE DEPARTMENT OF WEIGHTS AND MEASURES

By HOWARD E. CRAWFORD, *Inspector of Weights and Measures, City of Jacksonville, Fla.*

Mr. Chairman, members of the Conference, and ladies, the title of this paper pretty well describes Florida, except that we do have a very efficient inspection of gasoline pumps down there, handled under our commissioner of agriculture, Mr. Mayo. Mr. Berryman, who spoke to you for a few minutes this morning, is the assistant State chemist under Mr. Mayo. Their inspections go into other branches, such as analyses of gasolines and oils and other commodities.

The problems of a local sealer in a State not having a State department of weights and measures are of many and varied types. If I may place emphasis on these problems, but at the same time point to some of the advantages, I feel that most of you may accept this report with open minds and feel that the motive of the writer has been without bias.

All city sealers who become well established and successful in their work enjoy the independence granted them in the operation of their department. In some instances these sealers have been permitted to retain their offices during their entire lifetime. They have enjoyed the experience of speedy and satisfactory prosecutions through municipal courts. The penalties imposed by these courts have usually been mild, but conviction more certain. From the standpoint of preparation much less effort has been necessary, thus allowing the sealer to return more quickly to his varied duties.

There is no question but that many of us who have started in local fields, where there was no State weights and measures supervision, have had grave doubts as to the proper methods that we should follow in carrying out the duties of our offices. In such cases about the only reference we have had was to our National Bureau of Standards. This recourse has been splendid, and the

Digitized by Google

cooperation of its directing officials all the layman could ask for. However, the personal contact has proved to be the necessary missing link; the correction of the errors of the inexperienced local sealer requires the valuable aid of a State supervising head. New local sealers always require the sympathy and understanding of those who are familiar with the needs of a local department. He realizes the need of confidence, so that he may feel certain he is proceeding along accepted lines. But because there is no State department member to whom he can personally refer, he must necessarily base his judgment on his own experience as he acquires it from day to day.

The new local inspector who can rely on no State department for guidance, recognizes very early after assuming the duties of his office that the responsibilities incurred make it necessary for him to proceed with utmost caution. He cannot wisely institute proceedings upon the discovery of any violation of the law. Thus the inexperienced local sealer must lose much valuable time while waiting to be certain along which line to proceed. Were he to be operating within a State having a weight and measures department, he would have reference to that department whose experienced agents could ably guide him and aid in an early and prompt execution of his duties.

The local official is often in need of reference to State standards which are of greater accuracy than those in a city office. Where his state has no such department, he must refer to the standards of our Federal Government. This brings an expense and is inconvenient, and often causes the official to neglect having sufficient tests made.

It is agreed that publicity is one of the most important mediums in molding the favorable opinion of the public towards the weights and measures cause. In many cities the sealer cannot obtain the cooperation of his local news agencies. It is possible and probable that if a strongly established State organization existed the news agencies would recognize this publicity need. They would publish items pertaining especially to prosecutions because of their fear of neighboring cities carrying items of this valuable information to their readers, which would react to the discredit of the local press. An example which truly worked a hardship on the writer's local department occurred a few years ago when it was discovered that a certain merchant was stuffing turkeys at the Christmas season with wet corn meal. On investigation we found that each turkey was filled with from 1¾ to 2¼ pounds of meal, and that between 900 and 1,000 turkeys so stuffed had already been sold. After carefully collecting and preserving the evidence, a case was made in our municipal court. This court promptly tried the case, found the defendant guilty, and imposed a penalty. There was no newspaper publicity following in any local or State press agency. It was interesting to note however that one of those same local papers later carried an item from Washington written by Harry Ferguson. This article described how an agent of the United States Department of Agriculture had uncovered at another point, what our department had previously found here. Yet because of our lack of aid from a State department we had failed to secure proper publicity. Therefore, our observation is that our most valuable asset, favorable public opinion, can be more easily secured by the cooperation of an established State department.

Digitized by Google

Now in regard to laws. In many States without State weights and measures departments, there are no adequate laws pertaining to this enforcement branch. Consequently the sealers of the various cities and municipalities have no uniform codes to which to refer for guidance. Merchants and shippers are at a loss when dealing in consignments from varied localities. If there are no State laws in conflict, a grower of produce may follow a local custom in selling and delivering by measure what the city sealer's law requires to be sold by weight. Then, too, in some States there are no laws or regulations specifying the type of weights and measures equipment permitted for commercial use. In these States there is usually no weights and measures supervision, and because of this the local inspector encounters one of his most important handicaps. In such instances the local sealers' difficulties are general. Agents and individuals ship condemned weights and measuring devices into contiguous territory, and frequently this same fraudulent equipment is found in use, at a later date, in the locality in which it was originally condemned. The results of this condition are worth serious consideration, for we find the unscrupulous manufacturer's agent or fraudulent dealer disposing of worthless equipment to the unsuspecting merchant of another locality. Often these devices are against the merchant, causing losses that may contribute to his ultimate business failure; while on the other hand he may have been persuaded to purchase same because it was evident that it would deliver a short quantity.

Practically all of us have had experiences similar to those that I have mentioned. In Jacksonville, Fla., we were having a great deal of trouble with equipment that had been shipped out coming back on our hands from time to time, usually offered for sale by the little secondhand dealers. When Jacksonville became free of secondhand scales that were worthless, in the outside territory, South Georgia and going down into Florida, there were plenty of them to be found everywhere, because there was no weights and measures inspection. I was down in Ocala a few weeks ago with a friend, taking a vacation. We went around and found computing scales on the market being sold at prices of $5 or $10. Many of those scales came from Jacksonville, Fla.

State laws bring about a uniform State enforcement, and operate not only in adjacent counties but in the rural sections within the county surrounding the city in which the local sealer operates. Many of the sealer's most discouraging difficulties are due to the lack of supervision in these immediate local neighborhoods. A few years ago we found several of our local merchants displaying cane sirup put up in gin bottles of a capacity of only one-fifth gallon each, but marked "One Quart". Most of the merchants were found to be ignorant of this shortage. Had it not been for the reasonable attitude of these offending farmers this practice might have continued for a year before it was eventually stopped. Our department addressed a letter to each producer requesting that all sirup so labeled be taken up and properly relabeled. Because these farmers were willing to conform with the law, this illegal practice was promptly discontinued. We can easily realize how great a quantity of this commodity may have been sold in other communities. Had a

Digitized by Google

strong State weights and measures department existed perhaps this practice might never have started. The active local sealer observes that this or similar practices seldom originate within his own jurisdiction.

Where disputes arise concerning shipments from points within State borders, the local sealer finds a great need of cooperation of a State official. While the local inspector can substantiate the shortage or excess, as well as the accuracy of weighing devices employed in his city, he has no one to whom he may refer for investigations elsewhere.

With an active State department, strong State laws usually exist. These laws tend toward equal enforcement throughout the entire State. Local municipal laws cannot exist where they are in conflict with State laws. Hence the city sealer in a State without these central laws encounters many unnecessary problems, and it is usually to be observed that neighboring cities have laws that are in conflict with his own.

In our own State of Florida the weights and measures laws, except in a few instances, are weak and inadequate or not sufficiently explicit. Since we have no State weights and measures department, several of our cities have during recent years established their own divisions of this service. Each of these cities has set up its own enforcement body, and has enacted legislation without regard to uniformity. Laws in one municipality may conform to the model law which we as a body advocate, while other cities have enacted laws which they felt were necessary from their observation of their immediate needs. In many of our cities these laws have not demanded adequate attention to this branch of enforcement. Several others have only part time enforcement; and again some have given this authority to heads of departments directly responsible for the observance of other laws. In only a few localities are weights and measures departments found to be separate and distinct units. The department in Jacksonville over which I have direct charge was, until 6 years ago, a branch of our municipal inspector's office. His chief duty was to inspect all city licenses and collect from merchants who were delinquent. He was responsible for the collection of license fees which went into the city's general fund for the purpose of reducing millage against homes and business property. Thus, he was overburdened with the duties of his office and consequently he and his employees had little time to devote to our branch of enforcement.

We find that confusion results from this lack of uniformity, and that the absence of an active State authority operating under adequate State laws is largely responsible. As a solution to the problems of a local sealer so situated State enforcement may be regarded as ideal, but those of us who have labored to secure proper State laws with a suitable enforcement agency realize the difficulties encountered. Legislatures seldom appreciate the importance of needed laws unless there is a State law enforcement body to urge their passage. During these last few years legislatures have endeavored to satisfy what they believed to be popular opinion by holding down any increase of expenditures in State budgets. For this reason only, many States have been deprived of this needed branch of enforcement.

Digitized by Google

Until a State regulating body is secured, why not solicit the aid of the State's league of municipalities—where one exists? Through the cooperation of this important medium the cities in our individual States might operate with more uniformity until the ideal may be obtained—an adequate State weights and measures department.

THE TRAINING OF PUBLIC OFFICIALS

By HAROLD I. BAUMES, *Director, Personnel Training, League of Virginia Municipalities*

Mr. Chairman, members of the Conference, "trained public officials" is a phrase which several years ago was but the subject of theoretical discussion. It appeared in text books and was mentioned in college class rooms, but in actual practice, very little was done about it. Today, we are beginning to see the idea materialize. The movement has received emphasis perhaps largely as a result of increasing burdens heaped upon public officials and the inability of our young people to find private employment during the depression. The training of public officials has gained momentum rapidly and has now reached the point where colleges and universities, Federal and State divisions of vocational education, leagues of municipalities, various governmental units and associations of public officials themselves are attracted by the possibilities offered from this constructive endeavor.

All of these organizations may well be interested in the training of public officials as indicated by the following facts. A reliable estimate places the total number of public employees, Federal, State, and local in 1932 at 3½ million, approximately. Of this number over 1 million were local employees. In that same year, we appropriated something over 4½ billion dollars in salaries and compensation for public officials. Further than that, these individuals supervised the expenditure of all other governmental appropriations and I submit to you, is it not good business to make available a reasonable sum to train these officials to expend that money wisely and more effectively? And then, with this increase in the public personnel, has come a change in the attitude of citizens and taxpayers. Unquestionably, they have come to look to the government for more services than ever before. As a result, they are more interested in securing those services more effectively and economically. From the facts, it would appear that people are less inclined to the theory once stated that the government which governs least is best, and more inclined to efficiency in administration as expressed in Pope's statement, "For forms of government let fools contest; whate'er is best administer'd is best."

There are, of course, several distinct types of training for public service including for instance, advance training in colleges and universities, in-service training in colleges and universities, and in-service training sponsored and conducted by governmental officials themselves. It is particularly to this latter type of training that my remarks are addressed this afternoon, because this is the only kind of training which can benefit many of those now in active service and it is unfair in my opinion, to expect continually higher and higher standards of administration without at the same time afford-

Digitized by Google

ing an opportunity for those upon whom falls the responsibility of administering the affairs of our government to better qualify themselves.

Perhaps the training programs providing this opportunity to the greatest number of local government officials are those conducted with the assistance of leagues of municipalities which are merely State-wide organizations of local government officials now existing in about 35 States. The league training program in one State now embraces the following groups of officials: Policemen, firemen, water-works superintendents, food inspectors, finance officers, purchasing agents, assessors, public-works officials, municipal clerks, sealers of weights and measures, public-welfare officials, park officials, building inspectors, civil-service officials, sewage-disposal-plant operators, milk and dairy inspectors, recreation officials, janitors, mechanics, health officials, engineers, corporation counsels, plumbing inspectors, education officials, managers, judges and boards of plumbers. Similar but less ambitious training programs have now been inaugurated in several States and undoubtedly will extend in the near future to practically every section of the country.

Now let us see what is the position of weights and measures men in the training program developed for all of these important public officials. It is true that your number is relatively small as compared with some of the larger groups, but on the other hand, what service now provided by any of our governmental units requires more expert knowledge, technical skill, and patient diplomacy than the work now being carried on by you men to protect the public interests and to assure fair dealing among our people? It seems to me to be an opportune time for those of us who are most vitally concerned with weights and measures activities to see to it that the officials and employees of these important units be given the opportunities provided by the training programs in the various States.

While going through some material in my library in preparation for this talk, I came across "Weights and Measures Administration" by our mutual friend, Ralph Smith. The book was published in 1927 and contains a chapter on the training of the weights and measures official. Mr. Smith recognized the value of training as indicated in his statement, "in the case of the new and inexperienced official, the obvious course is the best one to follow; and that is, after he has learned all that he can from the published material on the subject of inspection and testing, let him seek the assistance of an experienced official for a course of practical training in actual field work." This was written 9 years ago and was sound advice. In fact, at that time, that probably was the only kind of training available to weights and measures men. There is one weakness, however, in such a plan which we now recognize, namely, that some of us who are most efficient in administering our daily tasks are entirely ill-fitted to instruct others. All of you, I am sure, are personally acquainted with people who are skillful in doing certain work themselves, but who would be utter failures in attempting to teach someone else how to do the same job. It is largely for this reason that we have now organized training schools either at a central point in the State or if the number of officials to be trained is sufficiently large, at several convenient points throughout the State.

Digitized by Google

It was our pleasure in Virginia last year to organize and conduct a central school for weights and measures officials which was typical of many of the short courses for other groups of public officials which have been held throughout the United States. The school was conducted by the League of Virginia Municipalities with the cooperation of the State Division of Markets and the State Division of Trade and Industrial Education with the assistance of the National Bureau of Standards. Mr. Ralph Smith of the National Bureau of Standards directed the school. This 2-day course was attended by State, county, and municipal weights and measures officials and was well attended considering the relatively small number of these officials in our State. I would like to outline briefly some of the principles followed in our school with the thought that they may be of interest to some of you who undoubtedly will plan similar schools in your State during the next few years. As a matter of fact, those of you who are connected with State associations of weights and measures officials are in an admirable position to inaugurate schools of this kind with the assistance of your State division of trade and industrial education and various associations of government officials. The following technique in organizing and operating a specific school is suggested:

1. *Make the school a weights and measures activity.*—It has always been my thought that if the training of any group of public officials is to reach its greatest possible success, the program must be organized and conducted by those officials themselves. In other words, it should be your training program.

2. *Plan all details for the school carefully in advance.*—In cooperation with the National Bureau of Standards, your State division of weights and measures, your State division of trade and industrial education, as well as with the cooperation of other professional groups, it is preferable, I think, to outline in detail everything which must be done before, during, and after the proposed school together with the approximate dates and time for each.

3. *Adopt curriculum after careful consultation.*—Consult not only sponsoring organizations of public officials but technical experts, educators and other qualified persons. Confine the curriculum to practical necessities of vital interest to the group to be trained. You will not have time for any extraneous or uninteresting material.

4. *Secure qualified instructors enjoying confidence of group.*—Upon your choice of instructors depends more than anything else the success or failure of your school. By all means, engage only those instructors in whom you are positive each member of the class has implicit confidence. In my experience, it is necessary to have one person in charge of the school who should be assisted by various specialists and practitioners in the particular field being studied.

5. *Sell each governmental unit in advance on the value of the proposed school.*—An appeal should be made to governors, mayors, city managers, legislative officials and department heads to take an active interest in any school which you propose to hold. This is important for several reasons. If they do not believe in the school themselves, they may think it a waste of time for any of their subordinates to attend. In other words, make your officials feel that the school is an important part of the activities of your particular governmental unit.

Digitized by Google

6. *Arrange program for necessary announcements, publicity and letters.*—Regardless of how good a curriculum and how well qualified a teaching staff one may have, the school will not serve its purpose unless you secure a good attendance of enthusiastic students. For this purpose, it is most important to outline in detail suitable publicity and announcements starting at the very beginning showing the need for training for a particular group of officials right through to the end when all specific details in regard to the opening of the school will be given. Approximate dates should be fixed for sending out each announcement and letter.

7. *Be sure your schools retain the atmosphere of a school.*—The training school should be distinguished from the annual convention of State associations of weights and measures officials as far as possible. Each serves a particular purpose. The school is intended for instruction only.

8. *Award appropriate certificates of attendance.*—I believe you will find that your officials will take considerable pride in certificates of attendance awarded at the conclusion of each school. In Virginia, for instance, these certificates carry considerable prestige through the inclusion of the signatures of the State supervisor of trade and industrial education, as well as of the director of the school, the head of the State division of markets, and the president of the League of Virginia Municipalities.

9. *Secure public backing for the school.*—Do not overlook suitable opening and closing exercises, which add greatly to the prestige and dignity of any school. If possible, have prominent government officials of participating communities present to speak briefly and also a few prominent citizens. Public relations of the weights and measures official are most important to the attainment of his objectives in the community and therefore the schools can assist him to this end, if properly planned.

Any kind of a training program results in a desire for more training. Once inaugurated, it will gain momentum rapidly and develop in a surprising manner. Moreover, it will be most conducive to loyal public support. This in turn will lead to greater respect for the work which you are trying to do, and in the end not only will benefit taxpayers and citizens who are the recipients of the service which you give, but should benefit you directly by recognition of the importance of the position which you hold and the technical skill at your command. As a result of the school held last year in Virginia, the Virginia Weights and Measures Association formed several years ago was revived. So much satisfaction was expressed at our first school that we are now planning to lay out a long term program of instruction in cooperation with the National Bureau of Standards by which the whole field of weights and measures work can be thoroughly covered one step at a time. My brief contact with weights and measures work has been most enjoyable. My associations with such men as Mr. Holbrook and Mr. Smith of the National Bureau of Standards, Mr. Meek of the Virginia State Division of Markets, Mr. Ragland of Richmond, and all the local sealers of weights and measures have been most pleasant. The little progress we have made in Virginia is a satisfaction to us and has served to stimulate our desire to develop the work started. It is probable

Digitized by Google

that some of you have gone much further in your States. Your experience will be valuable to us. On the other hand, if there are those of you present who have not developed training schools for weights and measures officials and who would like to do so, the results of our study in Virginia and the material collected is available to you upon request. The National Bureau of Standards, I am sure, stands ready at all times to cooperate in establishing training schools, and I would suggest also, if you have not already done so, that you contact your State league of municipalities.

It is often said that experience is a sure teacher. Many of us have learned this only to realize also that it is at the same time a tedious and costly teacher. There is represented in this room, for instance, several hundred years of weights and measures experience—considerably more than even the most optimistic of you individually can ever hope to have. By means of a training school the experience of each of you will be made available to your colleagues. Often, an exchange of ideas and experiences will save many costly experiments. In short, the kind of training which I have just described is nothing in the world but an endeavor on the part of the weights and measures officials themselves to make available to their own group the best knowledge and the best experience in weights and measures work known to date. I venture to predict that those of you who inaugurate training will never regret it nor will it ever be a disadvantage to you in any way. On the other hand, I am confident that you will find it a distinct benefit not only to the community which you serve but to you yourselves individually. None of us ever becomes too old to learn. Conditions and methods are constantly changing and we must continually study if we are to keep up-to-date, and retain an advantageous position as compared with our fellow men. Indeed, it has been the experience of all of us that the more we learn the more we realize how much we have still to learn. Last week I attended a meeting of fire school instructors in Virginia for the purpose of outlining a training program for the coming year. One of the fire school instructors present, a man of middle age who has contributed probably fifteen years of his life to the protection of life and property, stated that after he returned home from last year's school a member of his department facetiously asked him, "What did you learn at school this time?" and the fireman replied, "I though I knew something about the work of a fireman for years before I attended this school, but now I realize that I was only a 'lamp boy'." That is about the best recommendation of the training of public officials which I can make. Once you start training, you will never give it up.

You men can well take pride and must derive great personal satisfaction from your splendid contributions toward making this world a more honest and a happier place in which to live. Your work will maintain its important place among the most vital governmental services. Training undoubtedly will contribute in part to the desired development of your work in the future and if it does, it is my hope that it will not only better equip you and your colleagues to administer your important function of government, but at the same time build a truer conception of this function and a mutual understanding between citizens and officials which is so essential to improvement in

Digitized by Google

governmental administration. May it give you the confidence which comes from the realization that knowledge and skill possessed can never be taken away and the contentment that comes from a job well done.

SECRETARY'S NOTE.—Mr. Baumes left for the information of the delegates copies of the registration card used at the central school, the subjects included in the first curriculum, the certificate of attendance, and a list of those in attendance.

THE STATE AIDS IN STRENGTHENING THE LOCAL DEPARTMENTS IN TEXAS

By W. S. BUSSEY, *Chief, Weights and Measures Division, Department of Agriculture, State of Texas*

Mr. President and gentlemen, it is my privilege to present a paper at this Conference on a phase of our work in Texas in which I have been very much interested and fairly active for the past several years. Our State Department has enjoyed quite a marked success in this particular line, and no doubt this fact prompted the Conference secretary to extend the invitation to me to speak on this subject, "The State Aids in Strengthening the Local Departments in Texas."

As the great State which I represent is surrounded by jurisdictions where weights and measures administration is practicaly unknown, we have been compelled to work along without the advice and counsel of experienced neighbors. Being comparatively young in weights and measures work and as head of the State department, I have not heretofore been privileged to attend State or National conferences, or visit in such well-organized departments as are maintained in the various jurisdictions represented at this meeting. What we have accomplished, in spite of these disadvantages, I shall attempt to relate to you.

As you know, this field for service varies considerably in the different States. Some State laws make it mandatory upon cities of certain size to maintain weights and measures inspection; others simply make it possible for the cities to maintain the service, and leave it entirely to them as to whether or not they do so. The latter is the case in our State. In either case, however, the city department is under the supervision of the State, and the success or failure of the local department depends largely upon the aid and cooperation received from the State. Our weights and measures work is a division of the Department of Agriculture, of which Mr. J. E. McDonald is commissioner.

The State of Texas has about 20 cities ranging in population from 20,000 to over 300,000, and at the time the present commissioner took office in 1931, there were only four cities in the State maintaining a full-time weights and measures department, and each of these had only one inspector. About five or six other cities had a man who devoted part of his time to the work, but in most cases his activities were limited to answering complaints and requests. I venture to say that out of this number, very few had a proper conception of the work they were supposed to perform.

Mr. M. S. Fraze, who was then chief of the weights and measures division, now chief of the live stock division of the department of agriculture, became interested in this condition, as did the commis-

Digitized by Google

sioner and other members of the department. We began to make plans to improve the situation. The task has proved no easy one, and is not yet complete, but we have made considerable progress.

The city of Houston (named for General Sam Houston, hero of San Jacinto), which is the largest city of Texas, had been without weights and measures supervision of any kind, when, in March 1934, a modern ordinance was passed, creating a department composed of a chief inspector, three deputy inspectors, and a secretary. This was the first time in the history of the State that any city had gone so far in the weights and measures field. Our department was encouraged, and assisted in every way possible to make the new department a success.

One year later, in March 1935, the city of San Antonio (which is the third largest and probably the oldest city in the State), having only a one-man department at the time, passed similar ordinances and established a department with the same number of employees.

Then, in January 1936, the city of Dallas (Centennial Exhibition center, second largest city in the State), after encouragement from the State department, also adopted new ordinances and added two inspectors to their one-man force. It is understood that two additional inspectors will be added soon, to give Dallas the same size department as Houston and San Antonio.

The city of Fort Worth (live stock and trade center, our fourth largest city and the city which took the lead in weights and measures supervision in 1928), is now drafting new ordinances, proposing to increase their force from one, to three men, and make weights and measures a separate department of the city government, instead of a stepchild of the health department.

The city of Wichita Falls (home of the present Governor, a city famous in oil production, known as the "City of Faith"), has passed new ordinances, providing a one-man department, as yet not organized.

Let me assure you, these improvements in local departments were not easily gained. They did not just happen. They were accomplished only after a good deal of hard work, usually following this procedure: If the city in question already had a capable inspector, we first attempted to teach him the real meaning of his job and the importance of his office—that it was not only a matter of bread and meat to him, but one of economic interest to every one in the community. We endeavored to make him realize that the proper performance of his office was vital to the public welfare, affecting as it does the purchase or sale of every commodity, whether it be a box of candy for the sweetheart, or Texas' greatest product, the downy staple of "King Cotton." Then we enlisted the aid of civic organizations such as chambers of commerce, better business bureaus, and retail merchants' associations. Therefore, we were successful in obtaining the aid of the mayor, city manager, or some councilman, to the extent of sponsoring an ordinance. Now, it is an absolute fact that we have never failed to get a city to adopt modern ordinances and provide an adequate weights and measures department, when we pursued this course.

In our work with cities, the most frequent difficulty we encounter is finding a way to finance the department. Most cities in Texas

Digitized by Google

are already considerably involved for civic improvements, and are reluctant to make further outlays. However, once we have thoroughly convinced them of the necessity of the service—really sold them on the idea—they have always found some way to provide the funds necessary to carry the work forward. The city of Dallas inaugurated the unique system of a graduated tax on gasoline pumps in filling stations. We contend, however, that the most efficient and satisfactory way to finance the department is to include the amount in the city budget, so that it will be paid from the general fund.

We have found that city officials are always willing to do what the citizens want, once they have been convinced the desired change or improvement is a legitimate one, and renders a service that the people need and have every right to expect. In my opinion, there could be no proposition offered to a city government more desirable or more profitable in the long run, than that of an efficient and effective weights and measures administration.

Now, in getting these ideas across, and establishing new city administrations of weights and measures, we have been put to considerable work, and we have expended a lot more time and labor than is called for by the bare routine of our office. But we do not regret any of it. It has been time and labor well spent, for the advantage to us in having the cooperation of full-fledged, working departments in all the larger cities of the State cannot well be overestimated.

As I observed previously, our task is not yet complete. For, in addition to the cities mentioned, we have several others really interested, and we are expecting immediate results. We do not expect to stop until we have raised our supervision of weights and measures throughout the State to the high plane worthy of the great State of Texas.

I thank you.

HOW ARE THE BENEFITS OF STATE-WIDE INSPECTION BEST TO BE SECURED?

By J. H. Meek, *Director, Division of Markets, Department of Agriculture, State of Virginia*

In speaking on this subject I find it necessary to state some of my own experiences in Virginia, for which you will please pardon me. Conditions in some other States differ with those in Virginia, which may make it impractical to put into effect policies and carry out plans that have been used in Virginia. However, I believe in a number of States, particularly those in the South without a number of large cities or not densely populated, similar plans and policies can be used effectively.

I do not wish to brag about what has been done in Virginia, as I would like for a great deal more to have been accomplished, and I feel humiliated that there is not more being done at present, but, under the existing conditions I am proud that some worth-while things have been developed and put into effect in Virginia, even during the critical period of the depression.

For many years prior to 1924 there had been but little activity on the part of the State of Virginia relating to weights and measures.

Digitized by Google

The general assembly that year passed a weights and measures law very much in the form recommended by this conference and the National Bureau of Standards. Following this, there was considerable activity on the part of the State office to get local sealers appointed in the various counties and cities on the strength that the law required that they appoint sealers. Some local officials refused to appoint sealers, and others felt that the expense was too great. As a result of this, the law was amended in 1926 leaving it optional with the local authorities to appoint sealers.

When local authorities found it was not a requirement of the law, a number of counties and some small cities discontinued the work. Through economy and consolidation the funds for the State office were reduced to about $4,500 annually. Local authorities were urged to maintain or appoint sealers and the work was encouraged and fostered in general ways, but it was found that officials of sparsely settled counties and small cities were right in failing to finance the full-time activity of a sealer. In many cases where sealers were appointed they were inadequately supported, or did not give sufficient time to perform the duties properly. Under these conditions it became necessary to develop some plan with but little financial support, to extend some type of weights and measures activity to the large portion of Virginia where nothing was being done.

Believing that the testing of gas pumps was one of the great needs, several qualified men were sent into various sections of the State to test gas pumps. Facts giving the results of these tests were compiled and presented to the county and city officials where no work was being done, with a plan for performing the service by the State office, at a very low cost, by getting local funds paid to the State to supplement State funds. Local authorities cooperated finely in this plan, and gas pumps in from 20 to 47 counties were tested annually for a period of 4 years. The results of this work were compiled and placed before the general assembly in 1932, when practically all public expenditures were being reduced or discontinued. As a result of this, the general assembly authorized the Governor to transfer out of the gasoline tax an amount not exceeding $25,000 annually for the purpose of inspecting gasoline and motor-grease measuring and distributing equipment.

With this authority the governor transferred from the gas tax fund $15,000 annually for inspection of gasoline and motor-grease measuring and distributing equipment for 2 years. This enabled the State office to check all gas pumps in the State, where there were no sealers, and give sealers such assistance in inspecting gas pumps as they desired.

During this time the officials in counties and small cities where there were no sealers were requested to cooperate in financing the inspection of scales in a similar manner. In this way, the inspection of scales was started in a number of counties and small cities where it had never been done before.

For the biennium 1934–36 there was some reduction in funds appropriated for testing gas and grease pumps along with reductions in other appropriations to meet certain policies in effect in the State. During this time there had been a growing demand for the State office to inspect weights and measures equipment throughout the

Digitized by Google

State, not only from counties and small cities where no previous work had been done, but by sealers and local authorities where the work was not adequately financed.

As a result of this, the general assembly of 1936 restored the cuts in the appropriation for testing gas and grease pumps, and it is believed that a substantial increase in funds to meet the demands would have been appropriated had it not been for the unusual situation of a number of members of the general assembly getting sick. Also serious weather conditions broke down the roads and the repairs had to be financed by the appropriation from which the additional amount for testing gas and grease pumps would have been taken.

It is now generally considered in Virginia that it is impractical to maintain local sealers in the smaller sparsely settled counties or in towns or cities of less than 8,000 inhabitants. Some of our larger cities, particularly Richmond, have well organized and active weights and measures bureaus or services, but some of them are inadequately supported. We give such assistance to local sealers as they need and call for, and try to strengthen their activities as much as possible.

With our appropriation for the biennium 1936–38 we expect to test all gas and grease pumps and truck tanks, in jurisdictions where there are no local sealers. We also expect to secure financial support from local officials to supplement the State appropriation for testing scales—including livestock, coal, and warehouse scales—in a larger number of counties and small cities than before, where there are no sealers. With the increased demand from local sealers for assistance in their various duties, we will be unable to make the inspections of various weights and measures equipment in places where there are no sealers as regularly as we would like to; but we expect to get more done in Virginia than ever before, not only by the State office but by local sealers.

In these ways we hope to build interest in weights and measures work within the State that will get sufficient support to enlarge the appropriation in 1938 for testing gas and grease measuring equipment, and build a more permanent and adequate inspection service on scales throughout the State in places where there are no sealers, as well as cooperate with local sealers in enlarging and improving their work.

My closing statement will be made without intention of any reflection whatsoever upon the work of the National Bureau of Standards. That has been wonderful, and our cooperation from the Federal Bureau in the State of Virginia has been 100 percent. However, in view of the lack of Federal financial support in this great activity—our weights and measures work throughout this country—I have added this closing statement.

Since the Federal Government is spending money in so many different ways it certainly seems that with all the constitutional authority that Congress has to do weights and measures work, Federal money to supplement State and local funds should be used for developmental, promotional, and enforcement activities relating to weights and measures. This would bring about uniformity and enlarge the activity to meet the needs of the people. I hope this group

Digitized by Google

will make a strenuous effort before the next session of Congress to that end. Congress has spent large sums of money in almost every other conceivable way, and it seems time that weights and measures should be given some consideration.

Mr. DANIELS. I very heartily agree with the paper Mr. Meek delivered, but the last section of it was worth more than all the rest he said. I have been waiting for a long time to hear someone say that. I didn't have the nerve to. I believe he has said something that ought to bring good fruit.

PROPOSED AMENDMENTS TO MODEL STATE LAW ON WEIGHTS AND MEASURES

The CHAIRMAN. The Model State Law on Weights and Measures was adopted by the National Conference many years ago, and since that time it has been amended in a few respects. At this time Mr. Holbrook, secretary of the Conference, will propose for the consideration of the Conference certain amendments which are believed to be advisable. Mr. Holbrook.

Mr. HOLBROOK. Mr. Chairman and gentlemen, I have for your consideration certain proposed amendments to the Model State Law on Weights and Measures which I would like to present at this time.

Section 6 of the Model Law states, in general, the powers of the State superintendent of weights and measures. In section 6 powers are given to promulgate regulations for the guidance of county and city sealers, which are to govern the procedure to be followed by these officials in the discharge of their duties.

The Conference for some years, as you know, has been writing specifications and tolerances for weights and measures, yet in no place in the Model Law is the promulgation of specifications and tolerances made a specific power of the State superintendent of weights and measures. Now it may be that the general provisions are broad enough to cover this particular phase of the superintendent's work, but it seems desirable specifically to include this power in the provisions of the law.

I have heard it said by some local and State weights and measures officials that they have been informed that rules and regulations promulgated by a State superintendent were not valid as a matter of law. Some of them feel that the power to adopt specifications and tolerances belongs to the legislative branch and that the action of the executive branch in that particular respect will not be enforcible.

I do not believe that this is the proper interpretation, because I think it has been held by the U. S. Supreme Court many times, and most recently in the case of the Nebraska bread law, that rules and regulations may be promulgated which will have the force and effect of law. The legislative branch should outline the scope within which the rules and regulations are to be confined. The section which I will propose to the Model Law will set up such a framework.

As I have pointed out, the last sentence of section 6 provides for the issuance of regulations by the State superintendent of weights and measures. Specifically, it is suggested that section 6 be amended by adding at the end thereof the following:

The said regulations may include specifications and tolerances for all weights, measures, and weighing and measuring devices of the character of those speci-

Digitized by Google

fied in section 8, which shall be designed to eliminate from use, without prejudice to apparatus which conforms as closely as practicable to the official standards, those which are not accurate, which are of such construction that they are faulty—that is, which are not reasonably permanent in their adjustment or which will not repeat their indications correctly—or which facilitate the perpetration of fraud. For the purposes of this act apparatus shall be deemed to be correct when it conforms to all applicable requirements promulgated as specified in this section; other apparatus shall be deemed to be incorrect.

There are three suggestions for amendments, Mr. Chairman, but it seems that inasmuch as they are not directly related to each other they might be considered separately.

The CHAIRMAN. Gentlemen, a motion would be in order for the adoption of this amendment.

Mr. GRIFFITH. I so move.

Mr. HARRINGTON. I second the motion.

Mr. GRIFFITH. On the discussion, Mr. Chairman, may I inquire whether the phraseology of the amendment is sufficient to include the codes adopted by the National Conference on Weights and Measures for various weighing and measuring devices?

Mr. HOLBROOK. The codes adopted by this Conference may be made official in any State by promulgation by the State official. I have not suggested in here, nor did I intend to suggest, that the codes adopted by this Conference were to become operative in any State without the promulgation of the State official. I think that such an action might be very unpopular.

Mr. WARD. I have listened to the reading of the amendment and it sounds to me a little difficult to entertain without careful study, and for that reason I move that it be laid on the table until tomorrow, in order that the delegates present may have more opportunity to study it before taking action on it.

Mr. HOLBROOK. I think that is a very good suggestion, Mr. Chairman, inasmuch as these things are not in the hands of the delegates. I think these should be adopted only when the delegates have had an opportunity to study them carefully. If the gentleman will amend his motion to lay it on the table until later in the Conference, rather than tomorrow, we will have mimeograph copies struck off and will distribute them at the Conference tomorrow, and call this matter up again on either Thursday or Friday.

Mr. NEALE. I second the motion.

The CHAIRMAN. Will the gentleman accept that suggestion?

Mr. BLAYLOCK. I would suggest that the gentleman put in his motion a provision that it be made a special order the first thing Friday morning or Thursday afternoon, or some other certain time, so we may know when it is coming up.

The CHAIRMAN. What would you suggest as the time, Mr. Holbrook?

Mr. HOLBROOK. The first thing Thursday afternoon. That will fall in the center of a general discussion of subjects of interest brought up from the floor, and I think part of that time might well be devoted to this subject.

Mr. WARD. Mr. President, I accept that date when action shall be taken upon the amendment.

(The question was taken, and the motion was agreed to.)

Digitized by Google

Mr. HOLBROOK. If I may, then, I will read the other two suggestions, in order that I may tell why they are being advocated. We may consider that those fall in the same classification as the other, and fall within the terms of the motion adopted.

For some years efforts have been made, as you doubtless know, to enact Federal legislation to the effect that slack-fill and deceptive package goods be made illegal, whether or not correctly marked with the quantity contained in the package. Several States have that legislation upon their statute books, but as yet it has not been adopted by the Congress. It is being currently considered by Congress in connection with the proposed amendment of the Federal Food and Drugs Act, known popularly as the Copeland bill.

I think most of you will recognize the character of packages which are in mind. One buys a package, and sometimes finds that it is improperly filled only after taking it home and opening it. There is a certain type of package which, while slack filled, may never be discovered to be so—such packages as the perforated top package, out of which spice or some material of that kind is sifted. This package is thrown away without ever having been opened.

This suggestion is based upon the proposed provisions of the Copeland bill. It is intended to be known as section 23–a and reads as follows:

It shall be unlawful to keep for the purpose of sale, offer or expose for sale, or sell any commodity in package form if its container is so made, formed, or filled, or if it is so wrapped, as to mislead the purchaser as to the quantity of the contents; or if the contents of its container fall below the standard of fill prescribed by regulations promulgated as provided in this section. For the effectuation of the purposes of this section the superintendent (commissioner) of weights and measures is hereby authorized to promulgate regulations fixing and establishing for any commodity in package form a reasonable standard of fill of container.

It will also be necessary to amend section 23, second paragraph, first line, by striking out the word "section" and inserting in lieu thereof the word "act", since the words "in package form" will now have application to more than the one section in which they are at present contained.

The last suggestion is in relation to bread. We have heretofore specified that loaves of bread shall be sold in certain standard weights, and no other. Since the time when the section was adopted bread has commonly come to be sold in wrapped form rather than unwrapped form, and in some of the courts, arguments have been raised that the wrapping of bread in waxed paper results in its being made into a package rather than a loaf of bread. If it were to be held that bread in wrapped form was a package, it would no longer have to be of standard weight but might be marked with any weight which the maker desired to bake.

Also there is the new method employed in the sale of bread—sliced bread in wrappers is becoming very common. Again, tolerances in excess only have been provided for in some States and these have now been upheld as legal by the Supreme Court. The present wording provides for tolerances in excess and in deficiency. Therefore, it is proposed that in section 26 of the Model Law, in relation to bread, the first proviso be amended to read as follows:

Provided, however, That rules and regulations for the enforcement of the provisions of this section, not inconsistent therewith, shall be made by the

Digitized by Google

superintendent (commissioner), and such rules and regulations shall include reasonable variations and tolerances, in excess only, or in excess and in deficiency, which may be allowed.

Also, at the end of the section, the following words should be added:

For the purposes of this section, bread shall be deemed to be in the form of loaves whether or not the loaf is wrapped, and whether or not the loaf is sliced.

Mr. BLAYLOCK. We have a custom in our State where a good many of the bakers at one time marked their bread "16 ounces when baked." We cut that out. Then they got to marking it "15 ounces or over." Now they put a pound and a quarter in the loaf and still mark it "14 ounces or over." I would like to have the sense of the meeting as to whether that is permissible.

Mr. HOLBROOK. What is the object of marking bread which weighs a pound and a quarter, "14 ounces or over"?

Mr. BLAYLOCK. The idea was that we prosecuted them if the bread was too light; therefore they went to cutting down the marking of the bread and made the loaf they were baking any size they wanted to, and marked it "14 ounces or over." They knew they were absolutely safe, but they weren't marking what the bread actually did weigh.

Mr. SWEENEY. I don't know whether I quite caught the intent of the section that Mr. Holbrook spoke about. In Massachusetts at the present time the law specifies that bread shall be sold in loaves weighing 1 pound, 1½ pounds, or a multiple of a pound. Subsequently it states that bread may be sold in any weight, provided, if it is unwrapped bread, that it contains a sticker containing the manufacturer's name and the weight of the bread, or if it is wrapped bread, it contains a statement on the wrapper of the amount of bread contained in the wrapper. Is there anything there in conflict with what you are bringing out?

Mr. HOLBROOK. The Model Law section is a standard weight section exclusively; it does not allow the sale of other sizes than the sizes specified in the section, whether marked by weight or not.

Mr. SWEENEY. In the Massachusetts law you don't have to mark a standard loaf.

Mr. HOLBROOK. As I recall it, bread is not required to be marked under the terms of the Model Law, but it may be baked only in sizes weighing 8 ounces, 1 pound, 1½ pounds, 2 pounds, or multiples of a pound. This amendment is simply designed to state that that applies to wrapped bread as well as to unwrapped bread, and to sliced bread as well as to unsliced bread, because there has been some question as to whether wrapped bread or sliced bread is in the form of a loaf.

Now, in answer to the question of Mr. Blaylock. If the law does not prescribe standard weights only, then if bread is labeled "14 ounces or over" and weighs 16 ounces, that bread is undoubtedly legal in view of the decision of the Supreme Court in the first Nebraska law, which was to the effect that the bread laws were designed to prevent short weight, and that overweight was entirely permissible.

The latest decision of the Supreme Court in the case of the present Nebraska bread law is to the effect that certain excess tolerances

Digitized by Google

may be provided for, but only when these tend to prevent fraud through the baking of a size so large that it might reasonably be confused with the next larger size.

Mr. BLAYLOCK. But that gives them a chance to put out a 14-ounce loaf if they want to.

Mr. HOLBROOK. If you have no standard-weight bread law I think the people of your jurisdiction are very fortunate if the bakers of your section are putting 16 ounces in a loaf supposedly weighing 14 ounces.

Mr. STROBRIDGE. In California we have a bread law providing a tolerance in excess of 1 ounce on the 1-pound loaf and 1½ ounces on the 1½-pound loaf, but no tolerance in deficiency.

Mr. WARD. Is the intent of this amendment to standardize the loaf of bread?

Mr. HOLBROOK. The Conference is on record as favoring the standard-weight principle. The effect of the amendment proposed is to this effect, namely, that wrapped bread shall be in the same category as unwrapped bread, and that sliced bread shall be in the same category as bread not sliced, for the purposes of the section as it now stands upon our books.

Mr. ISING. Will the packages mentioned in the second proposed amendment have to be sealed?

Mr. HOLBROOK. It depends upon the law. Under the Model Law of the Conference anything which is wrapped, whether sealed or not, is in package form, because the words "in package form" are construed to include commodities in containers or wrappings of any kind. There is no requirement that the wrappings be sealed in order to make it a package under the Model Law.

In the case of each State the definition of a package controls the answer that would be given for that particular State. I can only speak in this connection about the definition contained in the Model Law of this Conference, unless I know the definition contained in a particular State law.

Mr. ISING. According to that, potatoes put up ahead of time before the customer comes up and buys them really ought to be marked, "10 pounds", or whatever might be in them.

Mr. HOLBROOK. Yes; under certain definitions of packages. In many jurisdictions I think it is required that packages put up in advance of sale be marked with their weight.

Mr. ISING. One of our chain stores was advertising potatoes at 10 pounds for 10 cents. They sold them by the bag, and we weighed one of the bags and it weighed 7½ pounds.

Mr. HOLBROOK. That is a question of the development of the evidence of what really went on in the transaction.

Mr. JONES. Isn't there a law that whenever a package is done up and tied it is compulsory to have the net weight of the contents marked on the package?

Mr. HOLBROOK. You would have to tell me the jurisdiction. It is not a general law by any means.

Mr. JONES. In the State of Maine we have this practice, that the net weight contents must be put on any package that is put up, but it does not constitute a package unless it is tied up.

Mr. HOLBROOK. That again depends upon the definition of the word "package." I consider that anything put up in a paper bag,

Digitized by Google

ready for sale before the time of sale, under the present Model Law definition, would be in package form.

Mr. JONES. Providing it was weighed in front of the customer?

Mr. HOLBROOK. Only if put up in advance of sale. Otherwise the quantity is determined after the order and it is simply put into a bag for the convenience of the purchaser. I am talking about things put up in advance and held for sale to a future customer.

Mr. JONES. We have our potatoes put up in bags containing fifteen pounds, and they are so marked.

The CHAIRMAN. These three amendments, then, will be mimeographed, distributed tomorrow, and brought up before the Conference on Thursday afternoon as the first order of business.[3]

Gentlemen, the session tomorrow morning will be devoted to the important subject of the testing of large-capacity scales. Again our program is a full one and it is urged that the members of the Conference arrive at the Bureau in time, so that we can get the session started promptly at 10 o'clock.

Mr. NEALE. It has been my privilege to visit or attend every Conference that has been held here since 1910, as an official thereof for 11 years, and I dare say never before has there been placed before this Conference a group of papers so closely allied as those you have heard this afternoon. It would be well if those could be bound in a separate issue.

(At this point, at 5 p. m., the Conference adjourned to meet at 10 a. m., Wednesday, June 10, 1936.)

[3] See p. 92.

Digitized by Google

THIRD SESSION—MORNING OF WEDNESDAY, JUNE 10, 1936

(The Conference reassembled at 10:15 a. m., at the National Bureau of Standards, Dr. Lyman J. Briggs, President of the Conference, in the chair.)

THE INSTALLATION AND MAINTENANCE OF LARGE-CAPACITY SCALES

By ALBERT VETH, Fair Scale Co., Louisville, Ky.

The installation of a large-capacity scale is probably as important as the scale itself, because the best manufactured scale has often been ruined by poor installation. Just what constitutes a good installation depends a good deal upon the work which the scale will have to do. We will describe a first-class installation which would be made by a purchaser with unlimited funds or who from experience appreciated the value of good practice. This installation would cost a good deal more than the average user wishes to spend. In the majority of cases in which the sealer's opinion is asked, it will be by the latter class of purchaser. In the first case his advice will not be requested, as the prospective user will probably buy a scale of high quality and follow good practice in its installation without the sealer's advice.

Just what constitutes good practice? We shall consider first a motor-truck scale, as this will probably be the type you will come in contact with most. A motor-truck scale depends entirely on the adequacy of the foundation for its satisfactory operation. Naturally this will be of concrete and it should be poured monolithic, that is, the side walls and bases which support the scale stands should all be poured without interruption. This will prevent, to a great extent, cracks through which water may seep into the pit and also give the piers the added bearing area of the end and side walls. In my opinion every motor-truck scale pit should be at least 5 feet deep in the clear and should be connected to an adequate sewer. In addition to having a 5-foot vertical clearance for purposes of inspection, it is also essential to provide ample clearance between the lowest live parts of the scale and the foundation. The use of low main-lever stands to meet a demand for economy in pit construction by purchasers in general who cannot see the value of a deep pit should be discontinued. In first-class installation, I would have the clearance between the lowest working part of the lever system and top of pier at least 8 inches. This will provide sufficient room for accumulation of dirt and foreign matter without obstructing action of the scale during the average interval between cleanings.

The top of the pit walls should be bound by coping steel, preferably angle iron, on all four inside edges. One of the poorest economies is to omit this on the sides. The concrete will soon be broken off and a valley will be formed in which foreign matter will naturally

Digitized by Google

collect and fall into the pit. Particular stress should be placed on the manner in which this coping steel is cast into the concrete. In general practice the foundation builder will wire this coping to the forms with the result that when the concrete is poured, the form moves inward away from the metal, leaving a projection inside the pit just on the bottom edge of the coping, which provides an excellent resting place for slack, coal, gravel, etc. Ordinarily when one looks at the top of this scale the clearance around the boards will seem to be sufficient, but this little ledge of concrete, usually about 3 inches below the top, has caused many a weight argument. It can be readily overcome by securely bolting the angle coping to the form boards. The foundation should extend under the floor of the building or office in which the beam is located and the beam pillars and standards should be mounted directly upon this foundation.

Another point in a first class installation which has often not been considered is ventilation of the pit. This has been gone into rather thoroughly in railroad track scale installations, but seems to have been overlooked in the case of motor-truck scales. It can be accomplished by a suitable vent pipe leading from the bottom of the side walls up through the roof of the scale office. Such ventilation would eliminate a good deal of corrosion which takes place in certain locations.

The top of the pit should always be located above the surrounding grade in order that no water shall drain towards it. It has been my experience that you can almost never get a scale located too high, especially in the average coal yard where there are no concrete driveways. There should be a roof over the scale, of adequate size. It is hard to understand why so many people build a shed over the scale just about the exact size of the scale platform. A roof, to do any real good, should extend at least 8 feet beyond the scale platform in all directions, and there should be ample clearance between the scale and the supporting posts.

Then too, a scale should be located so that normal-length levers can be used. I am very much opposed to the use of extra extension levers, which are often made necessary by the careless location of scales. I have frequently seen two short even levers, not over 10 inches long, used to place a beam in some particular location. This is very bad practice and should be avoided. If the manufacturer of your scale has designed it well, he will have eliminated as many levers as possible, and to place extension levers between it and the beam is to lose all the advantage gained by this design.

In discussing the scale itself it is difficult to go into detail without seeming to favor one make or another. The three most practical and best-known types of motor-truck scales are the conventional track-scale pattern, which is really a small two-section railroad track scale; the "A" lever pattern in which two long levers extend from the far corners of the pit and meet at the beam rod and have two short levers from the other two corners connected to them at the longitudinal center line of the scale; and the torsion-lever type, which is more generally known as the "pipe-lever" scale. Each has its advantages and if well designed one will do just about as good work as another. I am a believer in the

Digitized by Google

liberal use of cast iron in scales, and would say that the scale which is designed to use the least amount of what is commonly called wrought iron or steel in the lever system would be the most durable. Levers built up from structural parts, wrought pipe, etc., arc-welded together, in my opinion, have no place in a first-class installation.

Now comes the discussion of bearings and pivots. Pivots, of course, should be of standard pivot steel, fitted, hardened, and ground according to sound practice. The bearings which rest against these pivots should be of the same quality steel, handled in the same manner.

You have heard a good deal about rigid, ball, and suspension bearings. The rigid bearing is the oldest type. The levers are suspended by links and loops and the load is transmitted to them thru a bearing casting rigidly bolted to the weighbridge. This type is the least used in modern installations. There has always been some question in my mind as to whether or not rigid-bearing scales carefully designed and given the same opportunities as the other types would not perform as well as the other types. Each type can be built to the AREA specifications which have also been approved by the National Scale Men's Association and the Twenty-fifth National Conference on Weights and Measures. If these specifications are conscientiously followed by the manufacturer the buyer will get a good scale.

The suspension-bearing type is very popular. Here the main lever is supported on rigid stands resting on the piers. The load is transmitted through a suspension connection, the design of which depends on the manufacturer. This design should permit the weighbridge to move freely in all directions without disturbing the position of the lever system when the load is applied. This is very good, providing all the pivots and connections in the lever system, and the elements of the bearing assembly, are kept free of corrosion to prevent their "freezing", which means that the pivots and bearings must all be protected by an adequate covering of grease.

Use of these first two types of scales makes check rods necessary to control the oscillation of the platform. Check rods should be carefully fitted. They must be set level, or slightly higher on the girder ends, and must be absolutely free when the platform is at rest. Bumpers have been substituted for check rods on some suspension-bearing scales.

The ball bearing is used almost entirely with the pipe-lever type. It accomplishes the same purpose as the suspension bearing with the use of fewer parts. It consists of a bearing casting resting on the load pivot of the lever, which casting has on its top two saucers to receive the balls which are covered by another ball plate bolted to the weighbridge. This design is very simple, requires no check rods, and also gives adequate platform movement without disturbing the position of the lever. It should be noted here that these balls have no part in the weighing function of the levers and that a pipe-lever scale depends for its accuracy upon properly fitted knife edges just as much as in the case of a suspension-bearing or rigid-bearing scale.

The weighbridge of our first-class installation should have main girders of strength sufficient to carry the maximum loads without

Digitized by Google

deflection computed according to formulas used in general structural-steel design. There should be sufficient cross bracing between these girders to stiffen them, but otherwise the space between them should be clear of any other deck supports. If a wood deck is to be used, a suitable number of cross beams should be placed across these main girders and the floor timbers laid thereon. If a concrete deck is to be used these cross beams are not necessary.

The deck should be of sound timbers 3 or 4 inches thick, depending upon the nature of the timber used and the capacity of the scale. If a sufficient number of cross beams are used under it, a very nice installation can be made by laying the deck boards lengthways instead of across the platform. The deck boards should always be cut "under" to provide greater clearance at the bottom than at the top.

A concrete deck, of course, is ideal and should be not less than 5 inches, but preferably 6 inches thick. I am in favor of binding a concrete deck with I-beams rather than channels, as it provides more clearance around the sides. When used, the sidewalls of the pit should have at least a 1-inch recess matched to the bottom flange of this I-beam to provide clearance for cleaning.

We might briefly describe some of the features in the weighbeam of our first-class scale. It would be of the full-capacity type and the main bar should have 1,000-lb notches with fractional bar having 10-lb notches. It has always seemed very foolish to me to place 5-lb notches on 15- and 20-ton scales. Such little good as may be accomplished by the use of 5-lb graduation is probably nullified many times by the 500-lb errors which occur with the use of 500-lb main graduations made necessary thereby. The main poise should run on ball bearings.

The satisfactory operation of all this equipment will depend entirely upon how well the actual installation has been made by the mechanic on the job. If he has been careful to set all his levers level, and keep all connections perfectly plumb, the scale should give long and satisfactory service.

We might now consider what might be termed an average installation. In most cases the differences would be in that the main-lever stands would be shorter, the pit much shallower, little or no provision made for drainage, the beam mounted on the floor of the office instead of on its own foundation, etc. The weighbridge will be known as the shallow pattern, in which the space between the girders is filled with nailing timbers for the deck. The whole arrangement combines to make the scale very inaccessible and difficult to maintain. There are hundreds of scales of this type in use, due to the fact that money could be saved on the pit, and that the steel work was somewhat cheaper. If the work of installation is well done this type of scale will give very good results up to the point where dirt collects around the lever system. This dirt, of course, becomes wet, with resulting corrosion and, due to the fact that it is hard to get to, is rarely ever entirely removed until it has caused considerable inaccuracies by its interference with the working parts of the scale.

I believe that a sealer should give as much attention to the type and manner of installation of the scale as to the actual testing of it. Frequently I have seen scales freeze up tight overnight which had just been sealed the day before as correct. This condition subjects

Digitized by Google

the sealer to criticism because the user is very prone to blame someone else for his own carelessness in not keeping his scale clean. He also forgets that it was his own financial nearsightedness which prompted him to intall a shallow-type scale in the first place. You will find from this time on, you will meet more numerous installations of this kind under various trade names. They have been made to meet a demand for a scale which can be cheaply installed, but they eventually will cause the owner and the sealer just as much trouble as the poorest grade of scale made. Wherever possible the sealer should urge the use of a scale built along the ideal lines heretofore described.

No doubt all of you have had some experience with pitless scales. In my opinion the pitless scale is entitled to no consideration whatever from any sealer, unless exceptionally well made and then built with a pit under it, in which case it would cost more than a first-class pit scale. Most pitless scales I have seen have been made to attract a purchaser who wanted a whole lot of scale for very little money, with the natural results connected with all merchandise made with that idea in view.

We have not said very much about the old wagon scale, although there are many of them still in use. Naturally, when they are of timber construction, they depend as much upon the soundness and strength of the timbers used as upon the foundation itself. When they are of steel construction, the foundation rules as outlined at the beginning of this paper hold good. It has often been asked whether or not they can be successfully used for weighing motor trucks and the answer is "Yes", providing the rated capacity of the scale is not exceeded. Generally speaking, a wagon scale is good for weighing motor trucks up to 60 percent of its nominal capacity. There are certain cases in which the scale is actually heavier than the capacity marked on the weighbeam in which cases the motor-truck rating would be higher than 60 percent.

The greatest disadvantage of weighing motor trucks on wagon scales occurs in the checking system. Wagon-scale checking systems are designed to hold only the weight of the load put on the platform with the help of the team, which usually being on the approach acts as a brake to stop the load on the scale. Likewise this team applies the force necessary to start the load in motion against the approach. In weighing motor trucks this is different. Scale platform and checking system must take the shock of the entire braking action necessary to stop the load. Then when the truck is started to drive off, the scale platform must again resist the force of the wheels necessary to overcome the inertia of the load. When a wagon scale is intended to be used for a good deal of motor-truck weighing, the check rods and check pins should be increased at least 100 percent in size. This applies to rigid- and suspension-bearing scales. In the ball-bearing type no change need be made.

Rules applying for the installation of motor-truck scales apply also to most of the larger sizes of industrial scales used in manufacturing plants and otherwise. When scales are installed on the ground floor it is well to have as much pit as possible, although the 5-foot depth recommended for outdoor scales could be reduced somewhat. Particular attention should be given to the location of indus-

Digitized by Google

trial scales to avoid unnecessary travel over the scale platform. In general design, most of the industrial scales made by the better manufacturers are patterned after motor-truck scales and would be covered by the same rules.

When it is necessary to install an industrial scale in a steel or wooden frame building, the problem of securing adequate foundation is more difficult, and a competent architect should be consulted to provide the proper strengthening of the building around the scale. If the scale is located on the second or third floor, particular care should be given to shield the working parts from air currents which will cause considerable variations in weight. The sealer, however, will not have much occasion to pass on industrial scales of this type, as most of them are used to weigh material between departments in the same plant and as no transactions with outside parties are involved, he really has no proper jurisdiction.

Probably the next best known scale which the average sealer will be called to give advice upon will be the dormant warehouse scale. He will have very little difficulty in the quality of these scales, as most of them are made by reputable companies, and while there is unquestionably a difference in the advantages of certain designs, they will all do the work expected of them if properly installed and if they are bought heavy enough. At present most dormant scales are rated very high and it is my opinion that if the user is to weigh average loads of 1,500 lbs. he should not buy less than a 3,000-lb. scale. When the loads range around 5,000 or 6,000 pounds the average construction runs heavier in proportion and not so much additional capacity need be recommended. It is desirable in all cases, but especially so in heavier service, that dormant scales be manufactured with "bridged" ends. These eliminate the tipping action of the platform and cause all four load pivots to take the initial shock of the load, instead of only two. The value of this design is appreciated in track scales and it is just as desirable in dormant scales. They can be bought on special order but are not included in any of the regular lines I have seen.

The dormant scale is probably the most abused in the manner in which it is installed. A large percentage of the time the user provides his own foundation according to his own ideas and makes the installation with his own men, and then calls the sealer to check his work. It is here that the sealer should thoroughly inspect the manner in which the scale is installed before making his tests. If he has been consulted before the purchase has been made, he can readily determine if his advice has been followed and his course is clear and easy. If he was not consulted he is in the uncomfortable position of making the user tear up some of his own work. This is particularly difficult if the scale should happen to test correctly with a nominal amount of test weights.

When a dormant scale is installed in a concrete floor the pit should be at least 12 inches deeper than the depth of the scale itself. This provides space for the accumulation of dirt and water, makes the intervals between necessary cleanings longer, and naturally contributes to a more satisfactory operation of the scale. It might be well to repeat here that care should be used in mounting the angle coping around the edges of the pit so that the face of the wall will be per-

Digitized by Google

fectly flush with the angle, providing a clear passage for the dirt to fall through to the space provided under the scale. Concrete piers should be brought up from the bottom of the pit to match the principal bearing points of the scale, which are, in most cases, at the four corners. While these should be large enough to adequately support the scale, they should not be so large as to obstruct clearance space for dirt to fall through to the bottom.

There are an increasing number of what is known as "skeleton-constructed" dormant scales, as compared to the fully self-contained type, which was the only one known several years ago. The skeleton type is much superior to the fully self-contained type if the installation is well made and the scale parts are carefully assembled by an experienced man. Because no box is used, there is considerably less space for dirt to lodge and cause trouble.

When a dormant scale is to be installed in a wood floor the self-contained type, however, is much to be desired, as most wood floors do not provide the kind of foundation necessary for the successful operation of the skeleton type. The sealer should particularly advise the user concerning the difference in these types. It will be much easier for the user to make his own installation when a fully self-contained dormant scale is used.

The next type of heavy capacity scale we will consider is the hopper or tank scale. The large 2,000- and 2,500-bushel scales will not generally come under the average sealer's jurisdiction as they are mostly used for loading grain at terminal points and their inspection is taken care of by those having more experience and knowledge of such scales than the average sealer. In these large scales, as well as in the smaller tank scales, the same attention should be given to the foundation as in the scales heretofore described. There are so many different kind of buildings into which these scales are to go that it would be difficult to lay down any hard or fast rule as to what to recommend as a first class installation.

When a hopper scale is to go into a wood-frame elevator, it is desirable that its construction be such that a certain amount of settling of the building under heavy loads will not cause excessive errors. For this type of installation an "A" lever scale is probably to be desired. Where the construction of the building is such as to provide a rigid foundation, pipe or torsion-levers may also successfully be used. The pipe lever has the advantage of providing more clearance space for the outlet of the hopper or tank. It is also advisable to use all-steel construction and steel tanks on hopper scales. All valve-control levers should preferably be mounted on the hopper frame.

It has been found to be very bad practice to attempt to install the beam of a hopper scale on a floor below that on which the scale itself is installed. To do this requires the use of extra extension levers, which are a frequent source of trouble. The most satisfactory results will always be obtained by setting the beam on the same floor as the scale, in such a position that the levers may be directly connected to it. The room in which the scales of this character are installed should be so arranged that there will be no draughts or air currents around the scale. On large scales air currents can easily make a difference of several hundred pounds. In hopper or tank scales it has generally been preferable to use a weigh beam graduated to 1,000 pounds with

Digitized by Google

counterpoise weights making up the balance, although full-capacity beams are also used. The counterpoise weights can be readily checked on a sensitive balance, and the beam reading of 1,000 pounds can also be easily checked. From here on, the testing of a hopper scale, especially of the larger size, is somewhat a theoretical proposition. In fact when properly installed, the accuracy depends on the quality of work done on the scale before it left the factory, and for this reason the user of a hopper scale should use the most extreme care in the purchase of it.

I have also been asked to discuss the subject of maintenance. Adequate maintenance of scales which have been properly installed consists almost entirely of simply keeping them clean, parts free of rust, knife-edges and bearings packed in grease, and the platform in good condition. In general use, the platform of the scale gradually drops below the level of the surrounding floor. This should always be corrected and the scale platform kept just a trifle higher than the floor. Experience shows that a platform projecting even as much as three-quarters inch above the floor will not cause as much breakage of parts as one just a quarter-inch lower than the floor.

In the average beam scale and well constructed dial scale, frequent testing is not so necessary as it has sometimes been made to appear. The scale user should beware of the numerous service men who come about soliciting regular monthly testing and maintenance service, as most of this does little or no good, and has often resulted in harm. It has been my experience that any trouble that arises within the scale is usually quickly discovered by the man who does the weighing, at which time a competent scale man can be called in and the necessary work done thoroughly. The sealer should be especially cautious in testing scales which have numerous alleged testing labels posted upon them. This is not due necessarily to any inefficiency or lack of honesty on the part of the man who has applied these labels, but rather to human nature. In cases of this kind the owner feels he has done all that is required in employing someone to maintain his scales, and completely forgets about giving them any attention himself. On the other hand we have the man who has been testing this particular scale for possibly a year at monthly intervals, and always found it correct. Being in a hurry at that particular time, when he should have made a thorough inspection and cleaned out the pit before making his tests, he simply used a small number of test weights on the platform and affixed the label. It is well to note here that it is not necessarily a fact that a scale is correct because it tests within tolerance, as the weights obtained in actual service may be very incorrect, especially if an adequate test load has not been used.

There is also another reason for the solicitation of periodical test and maintenance service, and that is that it would give the one doing this work regular access to the scales and result in his being favored with the repair business. A further disadvantage of this service is that sometimes scales which are perfectly all right are taken up and overhauled unnecessarily. This condition is unconsciously encouraged by users of scales when they make the contract. They expect this periodical testing to overcome all their trouble, but usually do not want to pay what it is worth to do it conscientiously.

Digitized by Google

The best course for the user of scales to take is to purchase types of adequate size and the types best suited for his work, install them properly, and have his own men keep them thoroughly clean. If he follows this course, he will not have very many troubles. When they do occur he could call in a reputable man to correct the trouble and if, after reasonable length of time, shop repairs are needed, have them made. This again places his scale in its original condition.

I can see no reason why well installed motor-truck scales, which have been kept perfectly clean and dry, should have any tendency towards inaccuracy during the first year at least, and this also applies to almost all other beam scales. Automatic-indicating scales are subject to more troubles than beam scales and while, in general, the best ones should run 12 months at a time without any particular adjustment under ordinary conditions, it is also likely that they might become inaccurate at any time. Troubles of this kind, however, are usually caught by the operator as soon as they occur and could not be avoided by monthly inspection anyway. I do not mean by these statements to condemn good automatic scales, because the advantage gained by their use far outweighs the expense of the additional amount of service required to keep them in first-class condition.

We now get around to the point where maintenance hinges upon the thoroughness of the owner in keeping the scale clean, and the ability of the scale man who is to take care of such troubles as may arise. It is unfortunate that this scale man, who has been depended upon to do the work and possess the knowledge, has been responsible for a larger part of the troubles found in practical use of the scales. There are very few first-class, reliable scale men in proportion to the number of scales in use. Too often a man who has had experience with only one particular type or class of scale undertakes work on another type with which he has had no experience, to the owners' ultimate sorrow and expense. And then there is the scale man who has worked on every kind of scale for everybody and had 10 or 15 or 20 years' experience. I know some of these who are no better scale men at the end of 15 years than they were the first 15 weeks of their experience.

I hope the time will come when scale men will be classified and bonded, and thus restricted to work upon the scales for which they are qualified.

RECENT ACTIVITIES OF THE NATIONAL SCALE MEN'S ASSOCIATION

By R. O. Rask, *President, National Scale Men's Association*

Mr. President, members of the Conference, the last few years have affected the National Scale Men's Association probably a good deal as they have other lines of endeavor, in that its membership and activities have been restricted. But during the past year there has been put into effect a system of local branches as extensions of the main body, this for the purpose of interesting the men who work on scales other than large-capacity scales, and sometimes to interest men who for economic reasons have been unable to join us in our conventions. We have four such branches now, located at some of the larger points where a good many scale men come in, and we have

Digitized by Google

hopes of including not only the old guard that we have always had, but also the local scale men with industries and sealers of weights and measures.

The work of the members of our body is usually concerned largely with the large-capacity scales, due to the fact that the sealers of weights and measures usually do not have the equipment necessary to do the testing to take care of these. We have a common cause, in that the testing of large-capacity scales by railroad and industrial scale men is for the same purpose as the work done by the sealers of weights and measures, although we do have different work. The man concerned with the smaller type scales has his problems, as we do. In regard to sealers of weights and measures, I may say that I encounter them frequently in the States through which I work on the large-capacity scales, and I am always rather put out, each time a change of administration comes, to see some mighty good men arbitrarily taken out of office. This occurs usually at just about the time they have become really efficient as, in any line of work, regardless of education or background, it takes time to develop a particular knowledge of the routine and methods. I am probably out of place in saying this, but I sincerely believe that a merit system established to maintain these men in office would probably be of the greatest good to the fraternity as a whole.

In conclusion, I want to say that our next convention will be at Pittsburgh some time between April 15 and May 15 of next year, and we would be very glad to have such of you as are able and have the time, to attend with us. I thank you.

TESTING EQUIPMENTS FOR LARGE-CAPACITY SCALES, METHODS EMPLOYED, AND RESULTS OBTAINED

PAPER PRESENTED BY ARCHIE T. SMITH, INSPECTOR, DEPARTMENT OF WEIGHTS AND MEASURES, STATE OF NEW JERSEY

From all accounts there would seem to be a crying need for heavy tests on the wagon and motor-truck scales from practically one end of this land to the other, and heavy-duty testing equipments have not in any measure kept up with the developments in heavy-duty scales.

New Jersey, I believe, was among the very first to recognize this need and do something about it. In 1927 we purchased and outfitted our first heavy-duty test truck, with 4-cylinder motor, enclosed all-steel, covered-wagon type body, solid tires, and a top speed of 20 miles per hour. The truck was equipped with nine 500-pound test weights and a 500-pound 4-wheel truck. A chain hoist on a trolley suspended from an eye-beam track in the roof of the body and operated by hand, raised and lowered the weights as desired. It was necessary to push or pull the weights in and out, and spot testing was a very slow and laborious task. Nevertheless, heavy-duty scales started to sit up and take notice so to speak. A 5,000-pound spot test and a 15,000-pound gross-load end test was more than a good many of them could stand up under and deliver accuracy.

The truck was used mainly for special work at first, but it proved so popular with the scale owners and the demand for its services became so great, that about five years ago, it was put on full-time

Digitized by Google

duty. On the first complete tour of inspection, condemnations ranged from 25 percent to as high as 55 percent in the various jurisdictions. It took intensive effort during all open weather to make the rounds of the State in 18 to 20 months time and we have only been able to make three complete tours of the State, including back calls on condemned equipment. We hope to cover the entire State in 1 year with our new outfit which we have recently obtained. By strict adherence to tolerances and careful diagnosis of trouble encountered in each scale, we cut condemnations to a maximum of 20 percent on the last tour, which brings us to the advent of our much-needed and long-sought new equipment.

In designing our new equipment, we set up specifications which we felt would give us a maximum of efficiency in every detail and the results have so far proven very satisfactory. The truck is equipped with dual rear wheels taking 10.50 by 20, 12-ply tires, and with four-wheel air-brakes; it carries a factory guarantee for a constant gross weight of 30,000 pounds and is capable of sustaining a 45-mile an hour speed on level roads. It has five speeds ahead and, of course, a reverse. The motor has a piston displacement of 525 cubic inches and is rated at 48.6 horsepower. Due to low coverings over a good many scales throughout the State, it was necessary to keep the overall height to 8 feet when light. This meant cutting the head room inside the body to 4 feet. However, this has proven sufficient for all practical purposes and we are now able to drive under all coverings and make our tests.

The overall length of the truck is 22 feet 6 inches with a 40-inch track extension at the top rear. The wheel base is 172 inches and enables us to drive on all scales with sufficient capacity to handle the 30,000-pound load. All scales of 30,000 pounds or over, with a very few exceptions, are wide enough to take our dual rear wheels. For those few exceptions, we carry a 24 by 18 by 2 inch board beveled on one end which we place on the scale platform and run one set of wheels onto it, thus raising the outside tire free of the foundation wall and permitting the entire weight to rest on the scale platform. Being part of the truck equipment it does not have to be balanced out and works very successfully.

The enclosed well-built, waterproof body is sheathed with steel, both inside and out. It is 7 feet 4 inches wide, 11 feet long, and 4 feet high inside. Running lengthwise down the center of the smooth steel deck are two 1-inch angle irons 24½ inches apart which keep the 500-pound weights from shifting. A headlight mounted in the front of the body and controlled from the dashboard in the cab furnishes plenty of light when working under cover on dark days.

A dual winch is mounted in the front of the body with controls in the cab. There are three controls, all operated by the truck motor through the regular clutch. One control shifts the motor drive to the winch. This has the same effect as the motor idling out of gear and prevents potential accidents. The other two controls do the work. One moved forward from its neutral position raises, and moved back lowers, the weights. The other is operated in a like manner and moves the weights in and out of the truck. The operation is the same as the ordinary shifting of gears and is positive drive in all

Digitized by Google

four directions. The clutch is pushed to the floor and the controls shifted, whereupon the clutch is let in and the winch operates. The clutch pushed out, automatically sets the brakes on the winch and instantly holds the load at any desired point. The speed of operation is governed by the regular accelerator and the winch may be operated at high speed or very slow speed, as required. We have found this arrangement very satisfactory and a vast improvement over the old hand-operated chain hoist of the original truck.

Our testing equipment consists of four 25-pound weights, thirty 50-pound weights, twenty-two 500-pound weights, a 500-pound four-wheel rubber-tired truck, which will carry 5,000 pounds, and a two-wheel dolly with which one man can shift 500-pound weights to any part of a scale platform. Nine of the 500-pound weights and the 500-pound truck are from the original equipment purchased in 1927. The 500-pound weights, the 500-pound truck, and the new two-wheel dolly were all designed by our department.

It is imperative on a gross-load test that a very accurate check on gasoline consumption be kept at all times. With this in mind we had our gas tank equipped with a special gage of our own design and while this is very simple it performs its task admirably. It consists of valves at top and bottom on one end of the tank with a tubular glass gage connecting them, such a device as is used on a steam or hot-water boiler in your home. A heavy brass plate, fastened top and bottom and slotted in the center, was designed to permit a clear indication of the height of liquid in the glass gage at all times; this also acts as a guard against breakage of the glass. The tank was leveled and calibrated both in gallons and pounds from 0 to 38 gallons; 0 indicates a full tank, and thus the operator is enabled to determine accurately just how many pounds of gasoline have been used at any time and to deduct the correct amount from the total known load. The calibration markings are cut into the brass guard plate and are similar to those on a straight-face spring scale. Of course, the truck must be on a level plane for accurate reading and since this is the case when it is on a scale platform, the device does a good job.

Our method in testing heavy-duty scales as a general thing is to use the gross-load test on all scales of 30,000 pounds or over; on those of that capacity we make spot tests only when it is necessary to locate trouble or when calibrating State highway scales. All wagon and truck scales under 30,000 pounds capacity are given a spot test, and a capacity corner test certainly does show up any and all discrepancies. I want to say here that we have found the heavy spot test puts the careless or inefficient scale mechanic "right on the spot." Knowing his work will be carefully checked by our department, he is compelled to do good work or he will be very definitely "shown up." This is developing a very healthy condition in Jersey on scale repairs.

While three men are preferable, we are able with only two men on the truck to unload 2,500 pounds, spot all four corners of a scale, reload, and be on our way in not over 20 minutes, and we have done it on a speed test in 12½ minutes. A 5,000-pound spot test will average 25 to 35 minutes. Using three men we have unloaded the entire

95684—37——5

Digitized by Google

equipment, assembled the two-wheel dolly, made a spot test on a State highway scale, and reloaded in 1 hour and 5 minutes.

The truck is operated by one man from our department, who contacts the superintendents of the several county and municipal departments while operating in their jurisdictions. I want to say here that each and every one of our local officials has given his wholehearted cooperation in our testing projects and rendered the operator of our heavy-duty scale testing equipment every possible assistance.

In closing, I would like to add that we have equipped the truck with every possible safety device. It has signal lights for turns and fender guides, visible both day and night, and a 2-quart fire extinguisher under 100 pounds air pressure at all times.

We feel we have a piece of equipment that will stand up and give a good account of itself for some time to come.

(At the conclusion of this paper Mr. Smith showed lantern slides of the equipment formerly in use. Through the courtesy of the State of New Jersey, the new equipment described in the paper was on exhibition during the Conference and was demonstrated to the delegates at the close of this session.)

PAPER PRESENTED BY MATTHEW J. DISERIO, DEPUTY COMMISSIONER, DEPARTMENT OF PUBLIC MARKETS, WEIGHTS, AND MEASURES, CITY OF NEW YORK, N. Y.

I trust I may not be considered a bit presumptuous in appearing before so many able and experienced weights and measures officials, assembled here from so many parts of the country.

On January 2, 1936, I succeeded Honorable Alexander Hamilton as deputy commissioner in charge of the enforcement of weights and measures statutes and ordinances, in the city of New York, who formerly, in 1935, appeared before you at a similar conference representing the city of New York, and gave a talk upon the enforcement of the coal ordinance.

As a member of the New York Bar for the past 18 years, the only problems of weight with which I have had to contend, or become proficient in the handling and checking of, have been the so-called weighty tomes of law, and as for scales—a feeling possibly of confusion and wonderment, as to why the mythological figure, portraying Justice, should have for so many centuries and until our present period, permitted herself to remain so blindfolded, and her scales so unbalanced, in the dispensation of justice, as performed and administered in her good name. But that, of course, is not to be the subject of my discussion.

Prior to my appointment to this post, I had been for a while secretary to the department of licenses of our city of New York. This department, as some of you well know, has jurisdiction over the issuance of some fifty-odd branches of the licensing of various businesses and professions; and while in this department, I obtained considerable experience in the prosecution of licensees for violations of the various city ordinances, and statutes, as well as of the rules and regulations governing the same. Such experience at least qualified me, to a considerable extent, for the business of carrying on the official and administrative work of civilian policing, and the necessary enforcement required by the statutes and ordinances, in connection with the application and enforcement of true or standard weight

Digitized by Google



FIGURE 1.—*General view of large-capacity scale-testing equipment of the State of New Jersey.*



FIGURE 2.—*Another view of New Jersey equipment showing crane, hoist, weight-handling truck, weights, and interior of body.*

Digitized by Google

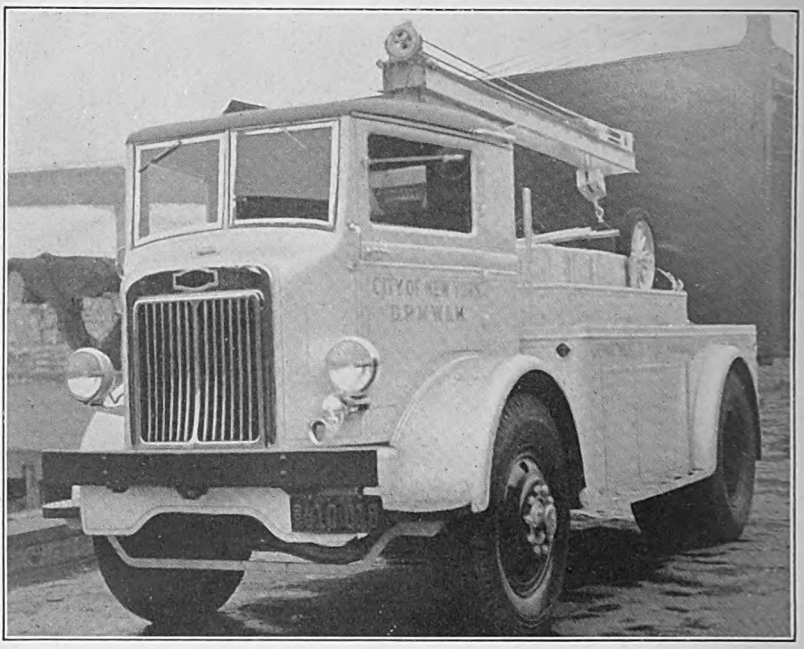


FIGURE 3.—*General view of large-capacity scale-testing equipment of the city of New York, N. Y.*



FIGURE 4.—*Another view of New York equipment showing crane, hoist, dolly, and weights.*

Digitized by Google

and measure in the city of New York. For the information of those who do not know, such enforcement in our city is at present exercised by the division of weights and measures of our department, known officially as the department of public markets, weights, and measures of the city of New York.

Formerly, the division of weights and measures, in such period known as the mayor's bureau of weights and measures, was an entirely separate city department with approximately 23 employees. In those days, the duties of the bureau were concerned chiefly with enforcement of the State statutes relating to correct standards of weights and measures, and included among such duties were the inspection and certification of scales, weights, and articles of count, or measurement. It at no time had reached the height nor the vast activities which are now embraced by the present division as now consolidated with the department of markets. In April 1933, the mayor's bureau of weights and measures was ordered consolidated with the department of public markets, and the title of both departments combined became then officially the department of public markets, weights, and measures.

The staff in my division, alone, now consists of approximately 75 employees, of whom approximately 70 are civilian-officers clothed with police power, engaged daily in the field of inspection and policing, and in the prosecution of violations and offenses. Since its amalgamation with the department of public markets, it has grown and assumed a position of even greater importance and is considered by many one of the finest units maintained by any municipality, for the enforcement and civilian-policing of such laws and ordinances, as well as for the investigation, supervision, and regulation of the other ordinances, or statutes with which the division of weights and measures is now entrusted, such as ice, coal, and kosher food.

New equipment for proper field inspection was purchased, and now under nonpartisan, progressive, and aggressive administration as had under the administration of Mayor LaGuardia, the enforcement of the provisions of the Federal and State laws, and city ordinances has now reached a point where I believe I can properly appear before a body such as this, with just pride in our accomplishments.

To give you a comparative analysis, in 1932 the total amount expended by the city for the administration of weights and measures activities was only the sum of $78,290. Twenty-three men were in the field, and there was no automobile equipment, except an antiquated old truck for the carrying of 50-pound weights. When it is considered that the total budget of the city for that year was nearly 520 millions of dollars it can only be said that the city administration at that time did not give to the enforcement of the laws concerning weights and measures, the full consideration it merited, nor to the residents of our city the protection to which they were entitled.

In the 318 square miles in the city of New York, there are more than 7,600,000 people. There are over 5,500 miles of streets. Some idea of the magnitude of the job of proper enforcement of the weights and measures laws and ordinances can be had when I inform you that last year alone, we licensed nearly 8,000 coal vehicles. The total number of inspections alone for 1935 was 105,519; instruments and measures, 249,894; large scales, 3,534.

Digitized by Google

Since the reorganization of the division, we have attempted to remedy the woeful neglect of previous city administrations. We now have seventy men in the field, or more than double the number in previous years. We have five passenger automobiles, making the force much more mobile, and thus we can cope with the problem of keeping up with, following, stopping, and checking coal trucks. The expenditure for weights and measures enforcement last year was $114,539, an increase of approximately 46 percent over the previous figure. It is hoped that with increased activity such figure shall become increased.

The results of this increased activity have fully justified the effort. Our men are turning in frequently as high as 1,000 violations a month. Compare this with 1932, when only about 800 violations for the entire year were reported, and this does not mean that New York is any the worse now than it was 4 years ago. It is obvious that the law was just not enforced.

Probably the most concrete improvement in the efficiency of the division, and one in which we take considerable pride, is our new equipment, a motor vehicle for the testing of the large-capacity scales, on display here and recently placed in operation. The cost of the vehicle was approximately $8,300. With the 21,000 pounds in weights which it carries, the truck and equipment weigh almost 20 tons. In the consideration of and in the ordering of such apparatus, the various publications of the National Bureau of Standards and others, were studied for ideas, and the apparatus already in use by other weights and measures jurisdictions was carefully investigated. We believe we have one of the most modern test trucks in the country.

The equipment, we find, will fill a long required need. Within the limits of the city of New York, there are 130 platform scales with total capacities of up to 30 tons, which are designated and bonded as official coal scales, for the reweighing when necessary, of coal deliveries to protect the consuming public from the possibility of short weight. A city ordinance requires that these scales be tested at least once in each month. This actually required more than five such official tests for each working day. In addition to these official scales, there are located at the various coal yards in the city more than 300 large scales. Further, the license fee for motor trucks in New York State is based on the gross weight of the truck, and in our city this must be determined on a scale tested and approved by the division of weights and measures. There are nearly 116,500 motor trucks so licensed in New York City alone.

The chassis of the truck is a standard six-cylinder engine-under-the-cab type, upon which is mounted directly back of the standard three-man cab, a traveling trolley crane. A special body was designed to carry the weights and to provide a working platform. The truck has dual rear wheels, and the tires are 11.25 by 24 heavy-duty truck balloon tires. The body is of 10-gage steel, the front, bottom, and sides being welded solidly together. The top edges of sides and front are flanged to provide stiffness. A 2-inch oak floor is bolted through the body floor and angle framing is provided to support the test weights and to hold them in place. The body skirting is of 16-gage steel. Rolled-edge fenders are provided. Enclosed

Digitized by Google

cabinets of 14-gage steel with oak floors and oak rub strips are for the stowage of smaller test weights and other equipment. A diamond tread 14-gage walkway is provided on each side of the body to prevent slipping by the operator, and the space around the crane and crane winch is closed to furnish a proper platform for the operator.

The crane consists of a structural-steel base and frame which carries a cast-steel mast support. A 12-foot horizontal double-channel boom swings through 180 degrees by means of a hand-wheel-operated worm gear. The load is carried by a four-wheel trolley running on top of the boom. This trolley at present is moved along the boom by a manually operated chain device, but this will be improved to operate by power. In the near future a power-operated trolley will be installed in its place. The crane winch is operated by a power take-off from the transmission.

We tried, as you will observe, to get an attractive and striking job for the psychological effect, as well as for general appearance. A canvas cover protects the test weights from the elements when not in use. Swing screw jacks are provided to relieve the chassis of strain when the load is over the side of the truck, and to take the weight off the tires when the truck is standing idle.

The wheelbase of the truck is 129 inches and the entire over-all length from the front of the radiator to the edge of the tail gate is 220¾ inches. The over-all width is 97¾ inches. The height of the floor of the body from the ground is 48 inches, and the over-all height to the top of the boom is 124 inches.

The test weights are twenty 1,000-pound, one 500-pound, and ten 50-pound weights. They are cast iron, aluminum-bronze painted, with lifting handle and adjusting plug. The 1,000-pound weights are 15 by 15 by 20 inches. These weights have been certified by the manufacturer as being within the class "C" tolerance of the National Bureau of Standards and since delivery, the Bureau of Weights and Measures of the State of New York, through the very kind cooperation of State Director Reynolds, sent a representative from Albany to certify and seal the weights with the State seal. By means of a two-wheeled cart or dolly with automobile wheels, one man or even a boy, as was demonstrated by the young son of Mr. Holbrook, is able to move one of the 1,000-pound weights about on scale platforms with ease.

The chassis, cab, body, crane, etc., weighs 17,000 pounds (8½ tons). The dolly and other extra equipment bring the total weight up to 38,800 pounds. We paid $1,307.50 for the 21 large weights, $67.50 for the dolly, and $5,942 for the truck, crane, etc.

On April 15, 1936, and after a private demonstration before Mr. Holbrook and Mr. Smith of the National Bureau of Standards, the truck was inaugurated into service by Mayor LaGuardia and other city officials at City Hall, and it has been in service ever since. The time has been really too short to develop any particularly valuable technical data on the results obtained with such new equipment. However, from about April 15 to May 16, 105 large-capacity scales were tested. Eighty-four were approved; the others showed errors of from 100 pounds to 800 pounds at the gross weight used of 38,800 pounds. Four of these indicated errors of 100 pounds, five of 150 pounds, five of 200 pounds, one of 250 pounds, three of 300 pounds,

Digitized by Google

and one of 800 pounds. On another scale, an error of 170 pounds at 5 tons was found, and one scale was condemned for mechanical defects. Two scales a short distance apart in Brooklyn, in the yards of two of the most reputable coal companies, were found to differ 350 pounds—one was 150 pounds fast and the other 200 pounds slow. Both of these scales, to our surprise, were official scales.

The importance of testing counterpoise weights has been brought home very forcibly. At one of the city institutions a new platform scale was installed by one of the largest scale manufacturers, and the division of weights and measures was requested, as is the custom, to test the scale before payment. This scale, which had a beam capacity of 24 tons, was found to be accurate. The scale company in order to increase the capacity to 27 tons, supplied a counterpoise weight marked 6,000 pounds. On further test, it was found that the weight actually balanced 8,250 pounds, an error of 2,250 pounds. I am hopeful that after we will have had more opportunity to use this new equipment, and especially after the speeding up the operation which will be accomplished with the installation of the power-trolley, we shall be able to develop further statistics of a more useful, technical, and practical nature, which he hope to report in the future.

New York City is not too large nor too proud to gratefully acknowledge the splendid aid and cooperation as received from the Division of Weights and Measures of the National Bureau of Standards through the official cooperation and assistance of Mr. F. S. Holbrook, its Co-Chief and secretary of this Conference, as well as the aid, cooperation, and assistance of the weights and measures officials in neighboring and other jurisdictions. I extend a cordial invitation to those of you who should happen to visit our city, to call and personally become better acquainted with our division.

(Through the courtesy of the city of New York, the equipment described in this paper was on exhibition during the Conference and was demonstrated to the delegates at the close of this session.)

PAPER PRESENTED BY JOHN J. LEVITT, SUPERINTENDENT, DIVISION OF STANDARDS, DEPARTMENT OF AGRICULTURE, STATE OF ILLINOIS

Mr. President, ladies, and gentlemen of the National Conference, I do not know of any phase of weights and measures work which is as important today as the testing of large-capacity scales. This phase of the work has been brought on by the rapid development of transportation facilities. The weights and measures departments, as well as the scale manufacturers, have tried to keep abreast, and it has been a hard job to do it.

All of you know that up until a few years ago the wagon scale was used for weighing wagon loads of materials, the load being evenly distributed, and usually of 3 or 4 or 5 tons. But today, with the modern truck hauling from 10 to 20 or 30 tons, with about 75 percent of it concentrated on one end of the scale, it is a different problem from what we had a few years back.

I am rather new in weights and measures work; I have only been in it about 4 years. But after taking over the State department I realized that we were wasting a lot of time and money going out and testing 20- and 30-ton scales with a handful of 50-pound weights, 1,500 pounds in all. Accordingly, I contacted members of the National Scale Men's Association, members of the National Bureau of

Digitized by Google

Standards, and some of my good friends in the scale fraternity. We immediately set about to figure on a real testing equipment for motor-truck scales. We had a committee appointed and held some 8 or 10 meetings. We considered the various designs in use; we drew up some designs of our own. At one time we were all sold on a roller wheel weight of 1,000 pounds or 2,000 pounds, and we even went so far as to impose on one of our good railroad friends and have a set of them made in their railroad shops. We figured that there were three things in connection with this heavy-duty testing that were necessary. The first thing was accuracy; the second was speed; the third was safety. With that preliminary survey, which covered about a year's time, the State of Illinois recently awarded a contract for the construction of what we think is the most modern, efficient, accurate, and practical large-capacity scale testing equipment yet designed.

This equipment consists of a 3- to 5-ton tractor truck with a specially designed custom-built semitrailer. The trailer has tandem wheels at the rear, the forward end being supported by the tractor, and has a clearance of only 12 inches from the pavement, and a loading height of only 18 inches. The equipment carried in this trailer consists of four 2,500-pound test weights, forty 50-pound test weights, one complete set of sealer's test weights from 50 pounds down to grain weights, and a complete set of test cans and measures from 5 gallons down.

The trailer also carries an electrically operated industrial fork lift truck, which is calibrated to weigh 5,000 pounds and is used to transport the 2,500-pound weights from the trailer to the scale, to different positions on the scale, and back to the trailer. The loading and unloading is accomplished by means of steel ramps, 10 feet long, which enable the industrial unit to load or unload two 2,500-pound weights at each operation. The power for operating the industrial unit is generated by an automatic gas-electric power unit, installed in the front end of the trailer, and the power is conveyed by means of a large insulated cable, 100 feet long, operated from an automatic reel, permanently installed in the trailer. This reel always holds the cable tight. The cable is attached to the industrial truck by means of a special plug that permits instant detachment when the truck is being used as a test weight. The installation of the power-generating unit and cable within the truck permits the maintenance of a reasonably constant accurate weight of the industrial truck, thereby making it available as a test-weight unit. The fork of the truck may be raised to a height of about 4½ feet, thus permitting stacking of the weights. With this mobile electric truck a complete test of a 10 to 40-ton scale, including corner tests, can be completed in from 30 to 40 minutes actual time, from arrival to departure.

The 2,500-pound test weights are of cast iron, rectangular in shape with tapered leg base, providing 5-inch clearance for the lifting fork to pass under the weight; each weight is provided with a 2-inch offset at either end of the top of the weight to facilitate stacking of weights. Each weight is provided with a sealing cavity in the center of the top under a lifting plug socket, similar to the one used on National Bureau of Standards weights. This lifting plug socket will permit the handling of weights by means of an adapter with

Digitized by Google

block and tackle or other suitable lifting device in case of an emergency, and also facilitates the calibrating of the weights. These weights are secured in the truck in stacks of two, suitably anchored to prevent any moving while in transit, and the industrial truck is likewise secured. The use of this industrial truck and these weights eliminates all manual labor, and also eliminates the abuse to which weights are subjected when they are pulled about on the platform. With our equipment you slip the fork of the industrial truck under the weights, pick them up, drive onto the platform, set the weights where you want them and back out. In that way there is practically no wear at all on the weights.

The entire testing unit is 28 feet long and 7 feet in width and the maximum height is 9 feet 6 inches from the pavement.

The trailer is equipped with a small door in the front of the right side to permit easy access to the gas-electric generating unit, and double rear doors are attached on piano hinges to permit swinging of doors against the sides of the car when opened. The tractor, trailer, and industrial truck are painted a rich dark blue, trimmed in orange, with the inscription, "State of Illinois, Motor Truck Scale Test Unit, Division of Standards, Department of Agriculture", appearing in orange on the sides and rear of trailer.

Delivery of this equipment will be made during the week of June 15th, and an invitation is hereby extended to all persons interested to attend the dedication ceremony to be held at the National Bureau of Standards Master Scale Depot, Saturday morning, June 20th. At this time, representatives of manufacturers who supplied parts of the equipment will be present and a thorough demonstration of the unit will be given.

It is the intention of our department in making tests of motor-truck scales to use test weights equivalent to one-fourth the capacity of the scale on each of the four corners, using the industrial unit as a strain load at the center after each corner test. This test will require a 2,500-pound load for 5-ton scales, a 5,000-pound load for 10-ton scales, a 10,000-pound load for 20-ton scales, and a 15,000-pound load for 30-ton scales. The readings will be recorded on a special report blank, a copy of which will be given to the scale operator and one copy sent to Springfield with the report of the inspection. This report will be valuable to scale repair men when making repairs or adjustments on scales that have been condemned for not being within tolerance. The 50-pound weights and smaller weights will be used in determining errors and for checking scales of smaller capacities than 5 tons.

In the past, tests on motor-truck scales have been made with thirty 50-pound weights on all scales regardless of capacity. The weights were handled by one man, and it required from 2 to 4 hours to check one scale. During a special survey made by this department covering 200 scales of all types and capacities, using 6 men and 5 tons of 50-pound weights, we found that over 50 percent of scales that were within tolerance on 1,500-pound tests were not within tolerance, when one-fourth of the scale capacity was applied on each corner. This survey was made at the suggestion of some of our mutual friends in the scale fraternity and the findings were sufficient to satisfy us that the methods we were employing were obsolete, inaccurate, and really

Digitized by Google

meant little or nothing. With this information and the encouragement of the National Bureau of Standards, National Scale Men's Association, Coal Dealer's Association, Grain Dealer's Association, and reputable scale manufacturers we were able to convince the administration officials of the necessity of a modern testing unit, with the resulting appropriation of $20,000 for such purposes.

The time consumed in the testing of a scale is important to our division. We work under a fee system and the department is expected to be at least partially self-sustaining. But that is not the most important consideration. The most important reason for speed is to accommodate the owner of a scale. Down in our State we have many coal mines, and a large amount of the coal is handled by trucks. When we go in to test a man's scale he may have 10 or 15 trucks waiting to be loaded and weighed. When you tie him up for 2 or 3 hours in testing his scale you do not make of him a good friend of your department. If you can go in and tell him you will make a complete test of his scale in 20 or 30 minutes you are really accomplishing something—you are saving him a lot of time and money. That is one of the reasons we considered the time element as being very important.

Since the appropriation was made we have found it necessary to get permission to use some contingent funds to give us a little more money to carry on, but the money will be well spent and I think everybody is going to be well pleased with the outfit. The cost of this truck, trailer, industrial unit, and weights was approximately $10,000.

Our department is deeply grateful to all those members of the scale fraternity, who so ably assisted us in working out the details of this unit. At this time I wish to personally thank all who participated in any way in bringing the design and construction of this testing unit to a successful conclusion, and I trust the improvement in the service of our department will partially repay them for the many hours of work and study they so freely gave us in assisting on this project.

(At the conclusion of this paper Mr. Levitt showed a number of lantern slides of the equipment described in the paper.)

DISCUSSION OF ABOVE PAPER

Mr. Ward. How much effect will snow storms have on the operation of that truck? You have a limited clearance there and your snow storms in Chicago are sometimes quite heavy.

Mr. Levitt. The clearance seems very limited, twelve inches, but the ordinary passenger car has only ten and a half to twelve inches clearance, and we can operate any time a passenger car can operate. We went into that very thoroughly. There may be days when it is real bad when we will have to tie up.

Mr. Harrington. Could you tell me the total cost of that outfit?

Mr. Levitt. Approximately $10,000. That included everything. Our purpose in buying the whole equipment on one contract was that the contractor would then be willing to devote a lot of time and attention to the unit. Also he could give a guarantee on it, whereas if we bought the truck one place, the trailer another, the industrial unit another, and so on, in case of any difficulty each would

Digitized by Google

try to blame it on the other fellow's equipment. We decided that the proper thing to do was to have one company build it and have them assume the responsibility for the operation of the truck, which they were glad to do.

REMARKS OF EDWARD K. STROBRIDGE, SEALER OF WEIGHTS AND MEASURES, COUNTY OF ALAMEDA, CALIF.

When I came into the department of weights and measures of Alameda County in 1917 the department was equipped with a light truck that carried a ton of 50-pound weights. I realized shortly that the testing of heavy-duty scales with a ton of weights was rather a joke, so I induced my board of supervisors to furnish me with a larger capacity truck. When we secured that two-cylinder truck we thought we had the finest equipment in the world.

The County of Alameda has a area of 800 square miles and there are some sections that are inclined to be a little hilly. I was much disappointed to find that when we had 5 tons of weights on the new truck we did not have power enough to get around to some of the scales that were located in the hilly territory, so we would have to unload half of them to get up to the scale and then go back and pick them up again.

In 1925 I designed a motor-truck scale-testing equipment consisting of a four-cylinder truck carrying five 500-pound weights, 5,000 pounds of 50-pound weights, a 500-pound dolly, and a 350-pound dolly. The weights were loaded on the dollies, and we made corner tests with 5,000 pounds on the ordinary scale. Of course, we used the truck as a strain load in conjunction with the corner tests. We never had an absolute known weight of the truck itself because there would be a variation in the amount of gasoline consumed, and we had to estimate that loss. This equipment was practically duplicated in New Jersey soon after mine was in operation; Mr. Foley, who was then superintendent of weights and measures of New Jersey, had me send him my plans and specifications, and their equipment was designed from mine.

In time we found that the size of the scales was developing much faster than the equipment for the testing of them, and after the experience of having designed two other equipments for testing heavy-capacity scales I saw no reason why we shouldn't have in combination with a truck a known-weight trailer, about which there would be no question as to its accuracy. This would be accomplished by having it sealed on the Southern Pacific master scale, which is tested each year by the National Bureau of Standards.

This new outfit was accordingly procured, and was put in service last fall. It is what we call a general utility piece of equipment, designed to test the 148 heavy-capacity scales in my territory. It comprises a truck carrying 8,000 pounds of standard weights, and a semitrailer loaded with railroad rails and standardized at 20,000 pounds. The outfit measures, when coupled up, 33 feet over-all. It is operated by two men.

In testing a multiple-section motor-truck scale, we use the truck to place the trailer over one of the end sections of the scale, and then drive the truck off the platform. The wheelbase of the trailer between the rear wheels and the small wheels that drop down to

Digitized by Google

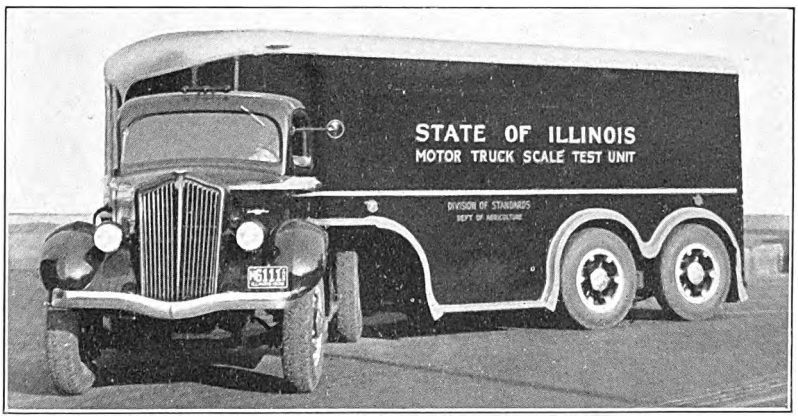


FIGURE 5.—*General view of motor-truck scale-test unit of the State of Illinois.*



FIGURE 6.—*Another view of Illinois equipment showing industrial truck, weights, and ramp.*

Digitized by Google

Digitized by Google

support the front end of the trailer, is 76 inches, so that we have our entire load on one section of the scale where it ought to be. After the test of the first section, the truck is attached, the small wheels are raised, and the trailer is moved on to the next section, and this is tested. This operation is repeated for the remaining sections until we come to other end section, where we couple up again, drive off, turn around, and bring our trailer back on to this end section so that the weight will be exactly over the section as it was at the opposite end.

When we have made this test and find that the scale is testing out at 20,000 pounds correctly we pull the trailer off and weigh our truck, which weighs about 18,250 pounds. This also was weighed on the master scale, and the variation will be slight, based on the amount of gasoline that has been consumed. When we have weighed the truck we couple truck and trailer together and put them on the scale. This is a test load of about 38,000 pounds.

When we started out with this equipment we thought that it would be necessary to make a corner test, but after using it for a short time we saw no reason, unless a scale was badly out of repair, to spend the time to make this. If the scale did not test out it was the job of the scale mechanic to find out where the trouble was and to correct it.

We still maintain in the truck the old 500-pound dolly and the chain blocks and the 500-pound weights, so that we can make corner tests if we feel it is necessary. When we do this we make the test with a load of 3,000 pounds. We also still carry the 50-pound weights which are accessible from the side of the truck.

In working a territory the motor-truck scales are tested first. The trailer is then parked and the inspectors go into the different warehouses or factories and use this equipment for the testing of all types of dormant scales. We have made it a practice, where we can, to put 1,000 pounds of known weight on a 1,000-pound scale, and 5,000 pounds of weight on a 5,000-pound scale.

We feel that this equipment is probably as good a general utility piece of equipment for the testing of dormant and motor-truck scales as there is in any county in the United States.

(During the course of his remarks, Mr. Strobridge showed lantern slides of the equipment which was being described.)

PAPER PRESENTED BY JOHN M. DANIELS, CHIEF INSPECTOR OF WEIGHTS AND MEASURES, DEPARTMENT OF AGRICULTURE, STATE OF MICHIGAN

Mr. President, ladies and gentlemen of the Conference: Michigan has long realized the necessity of a heavy-capacity scale-testing equipment, and on the 18th of December last an equipment of this nature was put into service. In view of what has been written and discussed relative to heavy-capacity scale-testing equipment and methods of testing, it is quite difficult to provide any new or novel apparatus, which in many cases must be limited in expense to conform to funds available. Therefore, in Michigan it was deemed best to provide a test of 10,000 pounds of known weight, due to road, bridge, and weather conditions. A heavier outfit might have proved troublesome when gravel roads were encountered at certain periods of the year.

Digitized by Google

The test units consist of ten 1,000-pound weights, carried in a standard commercial truck, provided with a 6-inch I-beam running entire length of truck body and extending 24 inches beyond at rear, the body being closed entirely with doors for full opening at rear. The body height of 6 feet provides ample head room for operating the hand-operated 1-ton combined hoist and traveler for moving the 1,000-pound units from truck to scale platform. A special two-wheel dolly is employed to transfer the weights to the desired locations on the scale platform.

This equipment has operated continuously since it was put into service excepting for 2 days of extremely cold weather. After this period of use under varying conditions it is obvious that improvements could be made. A power-operated hoist, and a hand winch form of traveler are the most important of these, since greater speed in making a test would be realized. Loading the weights is now a test of the physical ability of the operator. The type of traveler mentioned is quite necessary in the many instances where the approach to scale platform is steeply inclined. In some instances this prevents a test, it being impossible to move the weight along the inclined I-beam. Under normal conditions there is sufficient incline to the I-beam to prevent any danger of the weights getting out of control. Another method of overcoming the inclined-beam difficulty would be to provide a flexible support at inside end of beam and a method of adjusting the outside end of beam over a range of at least 6 inches.

To avoid unnecessary loss of time in loading and unloading the weights, the floor of body should be made as low as possible; the width should be no greater than cab to facilitate backing the truck to a scale and to make it safer in turning when in transit. A permanent top cover and sides is not desirable. A tarpaulin with fastening arrangements is sufficient to protect against storms. In case of a 10,000-pound equipment it will be found to be of benefit if the truck, minus the test weights, weighs slightly less than 10,000 pounds. Then, by a small added weight, the truck can be made to indicate the same as the test weights did and its weight thus accurately determined. The test weights can then be added, one or two at a time. A strain load of 10 tons is desirable in instances of 15- to 30-ton scales.

Owing to the numerous installations of housed or covered scales, the total height of equipment should be kept as low as possible to permit the use of the truck in instances where the scale capacity permits. The method of applying the test necessarily must vary to suit particular circumstances. The first step in all instances is the use of one ton applied on all corners; then one ton is applied on each corner at one end of platform, and this is followed by adding a like amount to opposite end of platform. The balance of the weights are then applied at the center, or in case of a 15- to 30-ton scale these may be applied to ends of platform only, or a special arrangement of weights may be used to further develop an indicated error. In all instances possible the truck is used to provide a strain load and thus bring the test into the commercial range of the scale. Great care must be used to avoid overloading a light or old scale by passing the gross load over the platform. The

Digitized by Google

loaded truck should be kept off the platform until an examination of scale capacity and construction has been made. As yet no damage to a scale or appurtenances has occurred through the use of this heavier equipment.

The reactions of scale owners has thus far been very gratifying. They have long realized that the former testing methods were inadequate. Needless to say, the purchasing public are equally pronounced in their approval of fair methods of testing. In numerous instances, scales indicated very well when tested as formerly, but when a more severe test was applied, serious errors were apparent. This was as anticipated by all parties familiar with scale performance.

The citizens of Michigan may justly feel proud that they have at the head of the department of agriculture men who are alert and responsive to the need and requirement of accuracy in fair dealing. James F. Thomson, commissioner, George S. Willard, deputy commissioner, and George S. Barnard, director, bureau of foods and standards, are giving their unqualified support to weights and measures activity in this State, and have made possible the equipment previously mentioned.

The writer would seem very ungrateful if mention was not made of the valuable and cheerful assistance rendered by Irving G. Wheeler, sealer of Jackson County, who had previously constructed a similar equipment.

The CHAIRMAN. Gentlemen, I feel that the Conference is to be congratulated upon the many evidences of cooperation among the members of the Conference in developing this important equipment for the testing of heavy-duty scales.

APPOINTMENT OF COMMITTEES

The CHAIRMAN. I have certain important committees, the membership of which I desire to announce.

Committee on Nominations—J. J. Levitt, of Illinois, chairman; James A. Boyle, of Portland, Me.; S. T. Griffith, of Baltimore, Md.; Martin L. Lang, of Indiana; Harry S. Provost, of New Jersey; Louis G. Waldman, of St. Louis, Mo.; and S. H. Wilson, of Georgia.

Committee on Resolutions—Walter G. White, of New Hampshire, chairman; W. S. Bussey, of Texas; J. M. Daniels, of Michigan; J. B. Fink, of Washington; C. P. Smith, of Suffolk Co., N. Y.; E. K. Strobridge, of Alameda Co., Calif.; and J. A. Sweeney, of Boston, Mass.

ANNOUNCEMENTS

The CHAIRMAN. I would like to call upon our secretary, Mr. Holbrook, for certain important announcements.

Mr. HOLBROOK. The following material is now available on the desk for distribution: The proposed amendments to the Model State Law; a report of the Committee on Specifications and Tolerances on modifications of specifications and tolerances and regulations for scales; a list of those in attendance at the present Conference; a sheet descriptive of the tour of the National Bureau of Standards laboratories, which will take place this afternoon; and, for those who desire it, a circular letter on specifications for the repair of scales of large capacity.

Digitized by Google

EXHIBITION AND DEMONSTRATION OF LARGE-CAPACITY SCALE-TESTING EQUIPMENTS

Mr. HOLBROOK. I think the Conference owes a vote of thanks, very sincere thanks, to the State of New Jersey and the city of New York for bringing, at their own expense, to this Conference their large-capacity scale-testing equipments which you have heard described. The next half hour will be devoted to a demonstration of those equipments, which are located, as you have doubtless observed, a short distance from the front door of this building. They will be available for more detailed examination in the afternoon and tomorrow also, but they will be in operation during the next half hour.

I might also mention that we are fortunate in having a Toledo exhibit truck here, in which are located various scales and precision devices. That truck is parked adjacent to the large-capacity scale-testing outfits, and I think it would be well worth while for you to make a visit to that. That will also be on exhibition this afternoon and all day tomorrow.

Mr. COYLE. If right and proper at this time, as a matter of record, I would move that this Conference extend to the city of New York and the State of New Jersey its sincere thanks for bringing their large-capacity scale-testing equipments here.

(The motion was seconded, the question was taken, and the motion was agreed to.)

(At this point, at 12:30 p. m., the Conference witnessed the exhibitions and demonstrations referred to above, and took a recess until 2 p. m.)

Digitized by Google

FOURTH SESSION—AFTERNOON OF WEDNESDAY, JUNE 10, 1936

TOUR OF THE LABORATORIES OF THE NATIONAL BUREAU OF STANDARDS

(The afternoon session of the Conference consisted of a visit to various laboratories of the National Bureau of Standards, particular attention being devoted to the Division of Weights and Measures. Special demonstrations were given in the laboratories, designed to illustrate the character and scope of their activities. In order to make the tour of maximum interest and helpfulness, the delegates and guests of the Conference were divided into small groups, each group being in charge of a member of the staff of the Bureau.)

Digitized by Google

FIFTH SESSION—MORNING OF THURSDAY, JUNE 11, 1936

(The Conference reassembled at 10:15 a. m., at the National Bureau of Standards, Dr. Lyman J. Briggs, President of the Conference, in the chair.)

The CHAIRMAN. The session will please be in order.

The Chair has some announcements to make. Inasmuch as I am to appear on the program a little later this morning I desire to place the first part of this morning's program in the hands of Vice President Baucom, and the program tomorrow morning I wish to place in the hands of our first vice president, Mr. McBride. The program this afternoon I will place in the hands of Vice President Lang. I shall ask Vice President Tinkey to take the chair immediately after the address of the Assistant Secretary of Commerce.

Will Vice President Baucom please come to the platform?

(Mr. Baucom was not present.)

DEMONSTRATION OF RECENT DEVELOPMENTS IN WEIGHING AND MEASURING APPARATUS, BY REPRESENTATIVES OF MANUFACTURERS

SECRETARY'S NOTE.—At this point several manufacturers brought before the Conference samples of apparatus embodying new design features, and demonstrated them to those in attendance. Particular attention was given to the new features incorporated, the method of manipulation of the adjustments provided, and the answering of questions asked by members. As was the experience in former cases, it was found that many of the remarks made are of no value to a reader when a sample of the product is not before him, and thus no good purpose would be subserved in printing such material here. Consequently it has been omitted from the report.

It may be noted that such demonstrations as these, which familiarize the delegates with new apparatus, are of great interest and value to them. Attendance at the Conference is the only way in which advantage can be obtained from program features such as this. The delegates were duly appreciative of the efforts of the manufacturers who took part in this demonstration.

(During the progress of the demonstration, C. D. Baucom, second vice president of the Conference, assumed the chair.)

END TESTING VERSUS CORNER TESTING FOR MOTOR-TRUCK SCALES

By M. J. J. HARRISON, *Chairman, Committee on Method of Test of Motor-Truck Scales, National Scale Men's Association*

Mr. President and gentlemen of the Conference, my program assignment might appear to limit my remarks this morning to the testing of motor-truck scales as a specific class. While I shall use that term for reference purposes in what I have to say, I would like to emphasize that, from the point of view of a weights and measures official, there is no reason for distinguishing between a motor-truck scale, as such, and a wagon scale, as such. It is elemental, of course, to mention that there are important differences between these two classes, from other than a weights and measures standpoint. These

Digitized by Google

differences include platform sizes, nominal capacities, and, most important of all, structural strength in proportion to nominal capacity. However, it is hardly the function of the weights and measures official to determine whether a given scale is a motor-truck scale or a wagon scale; it is his function to determine whether or not the scale will indicate the correct weight of any load within its nominal capacity. Both motor-truck scales and wagon scales are provided for the weighing of highway vehicles, and, in practice, a wagon scale may be used to weigh a motor truck, or vice versa. Therefore, for the purpose of the present discussion, let us assume that a motor-truck scale is any platform scale on which highway vehicles are weighed.

As a second preliminary in this connection, I would like to make the point that, in any line of endeavor, it is appropriate from time to time to take stock of methods and practices—to examine them to see if they are up to date or if they are merely the result of more or less adapted tradition. Every one of you gentlemen has seen changes in merchandising methods with the passing of years, and the introduction of new equipment of every kind by so-called progressive merchants. This has come about, often at considerable expense, simply because those merchants have been convinced in one way or another that their old equipment or methods were no longer efficient. It is just as important that weights and measures officials should examine their practices to determine their efficiency. I therefore propose a few pertinent questions, and my own answers thereto, with respect to the testing of motor-truck scales.

First, what are the objects of testing a motor-truck scale? I am of the opinion that they are three in number, to wit: (1) to insure proper physical condition of a newly installed or reinstalled scale; (2) during the useful life of the scale, to insure that its indications are accurate within legal or customary requirements; and (3) in the event of inaccuracies in weight indications as developed by test or otherwise, to aid in determining what corrective action should be taken.

It is obvious that the number of times that the official will have a new scale to examine and test will be relatively few as compared with the number of routine tests which he will normally make. Furthermore, subject to local conditions and to applicable regulations governing the amount of mechanical work to be performed by the weights and measures official, and more especially as a result of the gradual improvement in weighing equipment which always results from active enforcement of appropriate weights and measures laws and regulations, the number of times that the official will have to determine the exact corrective action to be taken with respect to a particular scale will be fewer than the number of routine tests which he will normally make. I therefore submit that the first consideration of the official should be to satisfy himself as a matter of routine that the indications of the scale are correct under practical conditions of loading.

This immediately suggests my second question, which is "What are practical conditions of loading of a motor-truck scale, and what relation should exist between such conditions and the technic of testing?"

In considering this question, let us refresh our memory as to the development of scale-testing technic. All of you gentlemen are

Digitized by Google

familiar with the procedure outlined in Handbook M85 of the National Bureau of Standards for testing platform scales, which rather definitely contemplates what may for convenience be called "corner testing." This is a perfectly proper procedure for the smaller sizes of platform scales, where the location and manner of application of the load on the platform are hardly to be controlled. So long as the load is entirely supported by the platform of such a small scale, its center of gravity may reasonably be assumed to occupy any position on the platform. However, this is by no means true with respect to motor-truck scales, where the loads are invariably applied to the platform on axles. Here we have at least a partial control over the lateral location of the center of gravity of the applied load, and that center of gravity will never, in practice, be at either side of the platform. Bear in mind, if you please, that the maximal width of motor-truck scale platforms is 10 feet, and that the over-all tread of highway vehicles varies from 5 to 8 feet, depending somewhat roughly on the carrying capacity of the vehicle. From these figures, it will immediately be obvious that the center of gravity of a small vehicle may, at the most, be 2.5 feet away from the longitudinal center line of a wide scale platform, while the center of gravity of a large vehicle would never be more than 1 foot away from that center line.

It will be admitted, I believe, that these considerations cannot be said to justify "corner testing", especially since the average operator of a highway vehicle will always tend to spot his vehicle near the center of the scale platform rather than close to one edge.

And, speaking of the development of testing technic, it is by no means improbable that the relatively small quantity of test weights with which all too many tests of motor-truck scales have been made has, in itself, suggested "corner testing." If this be so, it has probably been because the amount of test load was so small that no overload would result, no matter how the test load was concentrated on the platform, and it was simply applied as a "corner test" because that was the only way in which any material amount of load could be applied to a given main lever. In other words, I can easily believe that the practice was the result of circumstance, rather than a development of real testing technic.

My third question has to do with manufacturing practice. Has any change occurred therein which has a bearing on testing technic?

There is at present an apparently strong manufacturing tendency to produce motor-truck scales on what is usually called the "railroad pattern." This type of construction has been accepted as entirely satisfactory by scale men, and has been used for many years in the construction of railway track scales. From a weights and measures standpoint, the pertinent feature of this design is the absence of provision for "corner adjustment." In other words, there are no nose irons on the main levers, and lever ratio adjustment is possible only as between the ends of the platform, or for the scale as a whole.

My fourth question has to do with the amount of time required by the weights and measures official to make an adequate test. I emphatically do not want to be understood as suggesting that sufficient time should not be taken to accomplish the full purpose of the

Digitized by Google

test. However, is there any point in spending more time in doing a job than is required for the specific result desired? The amount of time required for a test of a scale to some extent controls the number of tests which the official can make in, say, a day, and in any event, directly determines the length of time during which the owner of the scale is deprived of the use of his property. It is obvious that the busier the scale, the more important it is that its accuracy or otherwise be determined, and the more costly to the owner will be his inability to use the scale by reason of the presence of testing equipment on or adjoining the platform. To my mind, the official should keep in mind the fact that a busy motor-truck scale is an important adjunct of the business of its owner, and, while sufficient time should be taken to make a competent test, the official should so conduct his test as not to tie up the business for an undue length of time. Therefore, if he can save time by not making "corner tests", as such, and at the same time satisfy himself as to the accuracy of the scale, he should so arrange.

It has been argued that "end testing" will not necessarily develop the same order of errors as will "corner testing." Personally, I doubt the validity of this argument, and I submit that an experienced inspector who makes an "end test" with an adequate test load will know beyond question whether or not the scale he is testing is weighing correctly. My belief, as just expressed, is confirmed by the comment made yesterday morning by Mr. Strobridge.

Those of you who heard my remarks at the Twenty-fifth National Conference, or who read the report of that Conference, will recall that I then called attention to the tentative recommendation of the National Scale Men's Association to the effect that corner tests of motor-truck scales need not be made except for information in the event repairs or adjustment were necessary. In what I have said today, I have tried to outline the considerations which led to that conclusion. These can be summarized somewhat as follows:

(1) Testing technic should be consistent with the conditions of practical use of the device under test.

(2) "Corner testing" is consistent with conditions of practical use of small-capacity and floor scales. It is not consistent with conditions of practical use of motor-truck scales.

(3) Modern manufacturing tendency is definitely along accepted lines which do not contemplate nose iron adjustments to affect individual corners.

(4) This Conference should formally recognize the value of that testing technique which requires the least time for testing a given scale, provided that sufficient test load is used to develop satisfactorily the correctness or otherwise of the scale under test.

(5) This Conference should formally recognize the development of conditions which did not obtain and could not be anticipated when the present Conference recommendations, as set forth in Handbook M85, were adopted, and should act to modify those recommendations so that they may be consistent with modern requirements. Specifically, it should be recognized that "end testing" of motor-truck scales will, as a matter of routine, save time in testing and develop all essential information for the weights and measures official.

I do not care to take up the time of this morning's meeting by reading the definition of a standard test of a motor-truck scale as tenta-

Digitized by Google

tively adopted by the National Scale Men's Association. However, I shall supply your secretary with a copy of that document, with the suggestion that it be included in the report of the present Conference as an appendix to my remarks this morning.

NATIONAL SCALE MEN'S ASSOCIATION TENTATIVE DEFINITION OF A STANDARD TEST OF A MOTOR-TRUCK SCALE (MAY 21st, 1935)

1. *Ideal Test.*—An ideal test of a motor-truck scale would be a test to the full nominal capacity of the scale, using test weights exclusively. Under favorable conditions, this can be approximated by the use of a sufficiently large quantity of test weights and a series of "strain loads", so ordered that the test can be carried forward by steps to the nominal capacity of the scale.

2. *Minimum Quantity of Test Weights.*—In practice, an acceptable test of a motor-truck scale requires a known test load of not less than 25 percent of the nominal capacity of the scale under test. When 25 percent of the nominal capacity of the scale exceeds 10,000 pounds, at least 10,000 pounds of known test load should be used. This test load should consist of standard test weights which have been properly verified and sealed.

3. *Strain Load.*—One or more strain loads, not necessarily of known weight value, are also required. It is essential that the total load applied to the scale (strain load plus test weights) at least equal the gross weight of the heaviest loaded vehicles presented at the scale for weighing. This total load will generally approximate the nominal capacity of the scale.

4. *Intermediate Strain Load.*—If the strain load used, or to be used, to produce the above named condition of loading, exceeds twice the value of the known test load used (test weights), an intermediate strain load should also be applied as part of the test procedure. The value of this intermediate strain load should approximate the value of the known test load (test weights) used in the test.

5. *Test Procedure.*—After balancing the scale with no load on the platform, the known test load should be applied, in increments of not less than the value of the main graduations on the weighbeam. As a minimal requirement, the apparent error of the scale should be noted and recorded when approximately one-half of the test-weight load is on the platform, and again when all test weights have been applied. Each element of the weighbeam and/or dial should be tested. "Corner tests" need not be made except for information in the event repairs or adjustments are necessary. The test weights should now be removed from the platform, and the balance condition of the scale should be checked. The intermediate strain load, if such is to be used, should be placed on the scale platform, and its weight as indicated by the scale should be carefully determined. The test weights should again be applied in the same way as above indicated.

If a second strain load is necessary to carry the test through the commodity-weighing range of the scale, the platform should again be cleared and the balance condition of the scale should be checked. The second strain load should then be applied, its weight as indicated by the scale should be carefully determined, and the known test load should again be applied as above indicated.

The value of the SR should be observed and recorded at both zero load and under the maximal applied load.

6. *SR Defined.*—In scales provided with a beam and trig loop, the SR (sensibility reciprocal) is the weight required to be placed upon the platform to turn the weighbeam from a horizontal position of equilibrium at the middle of the trig loop to a position of equilibrium at the top of the loop.

7. *Performance Requirements.*—The tolerances to be allowed in excess or deficiency on all motor-truck scales shall be two-tenths (0.2) of 1 percent of the applied load; provided, however, that the manufacturers' tolerances or the tolerances to be applied on all new or newly rebuilt motor-truck scales and wagon scales shall be one-tenth (0.1) of 1 percent of the applied load; and provided further, that the tolerances so applied shall in no case be less than the value of one of the minimal graduations on the weighbeam, except that the manufacturers' tolerances or the tolerances on new or newly rebuilt scales shall in no case be less than the value of one-half of one of the minimal graduations on the weighbeam.

Digitized by Google

The maximal value of the SR should not exceed twice the value of the minimal graduation on the weighbeam, and shall in no case exceed 20 pounds. For new or newly rebuilt scales, the maximal value of the SR should not exceed the value of the minimal graduation on the weighbeam, and shall in no case exceed 10 pounds.

When the scale is of the automatic-indicating and/or recording type, the tolerances to be allowed in excess or deficiency for tests at increasing loads shall be those specified for beam scales; provided, however, that the tolerance on the dial or reading face shall in no case be less than the value of one of the minimal graduations on the dial or reading face, or one five-hundredth of the capacity of the dial or reading face, whichever is less, except that on such of these scales as have a minimal graduation of 1 pound or more on the dial or reading face, such tolerance shall not be less than 1 pound. The tolerances on any beam or beams with which these scales may be equipped shall be the same as those specified above, except in cases where the value of the minimal graduation on any such beam is less than that of the minimal graduation on the dial or reading face, or one five-hundredth of the capacity thereof, whichever determines the minimal tolerance on the dial or reading face, in which case the minimal tolerance on any such beam shall be the minimal graduation on any beam with which the scale may be equipped. The manufacturers' tolerances or the tolerances on all new or newly rebuilt automatic-indicating and/or recording scales shall be one-half of the values specified above.

8. *Miscellaneous.*—If the scale is equipped with a type-registering weighbeam, or with an automatic recording device, the inspector should satisfy himself by trials at several points between zero and full capacity that the type impressions are clear and legible and that the recorded values agree with the respective poise or dial indications.

An adequate report form is essential. All readings should be taken with due care and with as much precision as is consistent with the sensitivity of the scale; however, it should not be necessary to take readings closer than to the nearest pound. The entries on the report form should convey a clear picture of the performance of the scale under test conditions.

Attention is called to the necessity for caution in interpreting test results and in applying tolerances when strain loads are used in addition to the test load of known value.

Attention is further called to the fact that several testing agencies have demonstrated the economy of using test weights of 500- and 1,000-lb denominations instead of the more usual 50-lb weights, for testing scales of the classes here referred to. Appropriate means of transportation and devices for handling must, of course, be provided if weights of the larger denominations are to be used.

THE NATIONAL BUREAU OF STANDARDS PLAN OF COOPERATION WITH OFFICIALS IN RELATION TO TESTING EQUIPMENT FOR LARGE-CAPACITY SCALES

Dr. Briggs. Mr. Holbrook and Mr. Smith of the Bureau have recently given much attention to the subject of testing equipment for large-capacity scales used in weighing motor vehicles. The discussion yesterday confirms our belief that the adequate testing of these scales and the design of equipment for this work is one of the most pressing problems of the weight and measures official and that this subject is one of the most important things before the Conference.

I am happy to inform you that the Bureau has recently made arrangements for the purchase of equipment for testing large-capacity scales. We have two reasons for procuring this equipment. One is that it will enable us to test large scales owned by the Government; the other, and perhaps the more important one, is to assist those States that have not as yet procured suitable equipment for the testing of large-capacity scales. Through the agency of this equipment we shall be able to secure and furnish information to these States regarding some of the scales in their respective jurisdictions. This will

Digitized by Google

enable them to determine whether or not they require special testing equipment and to present the results of actual tests in case it is demonstrated that such equipment is needed.

The discussion yesterday gave us up-to-date information regarding the various types of equipment which have been developed for this purpose. Throughout the development of all of this equipment, including our own, there has been an extensive interchange of ideas among these various groups in the effort to realize equipment which will be the most satisfactory for its purpose.

Mr. Chairman, may I now suggest that you call upon Mr. Holbrook to outline the procedure which the Bureau expects to follow in the operation of its equipment, and then upon Mr. Smith to describe briefly its type and design? Thank you.

The ACTING CHAIRMAN. We will now hear from Mr. Holbrook.

Mr. HOLBROOK. Dr. Briggs has told you that we are purchasing a large-capacity scale testing equipment and has emphasized that this is being procured in furtherance of a desire to assist you in obtaining your own equipments for the adequate test of large-capacity scales. We intend no routine testing of scales, except, as he has said, of those owned by the Government of the United States.

As you know, the advent of the large-capacity scale has been extremely rapid, and the capacity of these scales has been increasing by leaps and bounds, so that the weights and measures official has in many cases been left far behind in the procurement of equipment for the proper test of such scales.

The Bureau has been doing, up to this time, what it could to assist the various jurisdictions in their efforts to obtain equipment. For some years the item of proper testing equipment has been recurrently upon the program of this Conference, and we have attempted to put before you all significant advances in equipment. That is well illustrated, I think, by the papers this year, when five highly desirable equipments were described, all of which have been obtained within the past year. Also the Bureau, a few years ago, issued a special miscellaneous publication describing some of the equipments in use and containing an introduction strongly emphasizing the need of the adequate test of large-capacity scales.

My first job with the Bureau of Standards in 1910 was an investigation of commercial weights and measures throughout the United States. That sounds like a big assignment, and it was, in fact, a big assignment. In 1910, weights and measures inspection was almost unknown, or at any rate it was known in only a small percentage of the jurisdictions in the country. Massachusetts was inspecting weights and measures; New York State was inspecting weights and measures, and a few of the other States and some of the large city jurisdictions were doing such work, but inspection of weights and measures was not country-wide by any manner of means. The Bureau inspectors, of which I was one of two, visited, I think, every State in the United States inside of a period of 2 years. They made inspections of weights and measures in commercial use in perhaps some 250 cities in the country. They made reports on the conditions existing in those cities, and those reports, I may say, demonstrated extremely unfortunate conditions, conditions which are probably not known today in any part of the United States.

Digitized by Google

Those reports were avidly seized upon by State legislatures throughout the length and breadth of the country, and within a very short period, a number perhaps approaching half of the States had enacted some legislation in relation to the inspection of weights and measures; much of the legislation was general in its nature and established inspection departments.

Perhaps today, in this particular field, we have an opportunity of doing much the same character of thing which we did in 1910 and 1911 in the general field.

Roughly, the plan is this: We will have an equipment which will be competent to determine the condition of large-capacity scales. We will entertain requests from States and large city and county jurisdictions which are not properly equipped at the present time—and that certainly includes a very large majority of the jurisdictions in the United States—to bring that truck into a State or a large city or county jurisdiction at the request of the State or local weights and measures official. With his assistance and cooperation we will test a certain number of motor-truck scales in the jurisdiction, perhaps 50, perhaps 100, perhaps 150 scales in jurisdictions which have a very large number.

The State or local official may pick the scales which are to be tested and lay out a routing before the Bureau equipment arrives. The truck will be accompanied by a representative of the State or local jurisdiction who will work along with our men who are operating it. We will test the designated scales; we will prepare an individual report on each scale tested, which will be furnished to the official and to the owner of the scale; and at the conclusion of the work in a given jurisdiction we will be prepared to make a summary report showing the general condition of the large-capacity scales in the jurisdiction as demonstrated by those tested. This report will include recommendations to the official in charge as to the proper proceeding which he should adopt in this connection.

We suspect that in jurisdictions in which tests have not competently been made, it is probable—I think perhaps it is inevitable—that the conditions will demonstrate the necessity of the State or city having a test truck of its own. States have told us—many of them—that if they were able to demonstrate conditions there would be no question but what the legislature would appropriate the money for proper equipment. With this report in his hands the official will be able, certainly in most cases, to demonstrate that necessity. Armed with that report he can go before his governing board or body, his Governor, his budget committee, or his legislature, and point out the necessity which exists. We hope through the operation of this equipment that we will obtain in many of the jurisdictions of the United States information by means of which the State or local weights and measures official will be enabled to strengthen what is now one of the weakest features of his work—the testing of large-capacity scales.

The ACTING CHAIRMAN. I might say right here for North Carolina, to Mr. Holbrook, that we hereby make our request and extend our invitation for a visit to our State as soon as he is ready to proceed with this testing program.

Mr. HOLBROOK. That will be recorded, Mr. Baucom.

(At this point, Mr. Tinkey, fourth vice president of the Conference, assumed the chair.)

Digitized by Google

The Acting Chairman. Ladies and gentlemen, this is quite an honor, I assure you. The next speaker on the program will be Ralph W. Smith of the National Bureau of Standards. He will continue the subject under discussion.

Mr. Ralph W. Smith. I shall outline to you very briefly the characteristics of the testing truck which the Bureau is about to acquire. I may say, in preliminary comment, that in deciding upon the type of vehicle we had a number of considerations in mind. One was that we proposed to operate the vehicle throughout the United States, over all kinds of roads, in the mountains where the elevations are great, and over severe grades. We expect our unit to be away from base most of the time.

We desired a unit of conventional type insofar as such conventional type would adapt itself to the needs of the testing service. We desired a unit which could be duplicated, or modified only in more or less minor respects, by States to fit their particular needs, both mechanical and budgetary. Therefore we decided, finally, after giving consideration to all of these factors, upon the general type of equipment which may best be described as the swinging boom, traveling trolley and hoist type.

The chassis of this equipment will be a six-wheel job with a motor amply powerful to meet any condition which we may anticipate. It will be equipped with an inclosed cab and will have an open body. Behind the cab will be mounted the mast of the boom and crane assembly; there will be side boards but nothing more in the way of side body. Weather protection for the weights will be secured by means of a tarpaulin cover of some kind. Adequate storage facilities will be provided for carrying the personal baggage of the men in charge of the equipment and the small weights, accessories, and tools which are necessary in the operation of the equipment.

The crane will be of a type which will successfully handle three 1,000-pound weights at a time, thus permitting the 15,000 pounds of weights which the truck will carry to be set off on a scale platform in a minimum of time.

The test procedure contemplates end testing with the full 15,000 pounds of known weights when the capacity of the scale under test is such as to justify that load. The weights will be unloaded from the truck directly on to one end of the scale, and will later be moved to the opposite end of the scale by means of the conventional two-wheeled hand-operated cart. At the conclusion of the test at that end of the scale the weights will be removed by the cart; the vehicle itself, the truck, will be placed upon the scale as a strain load and the weights reloaded into the vehicle, thus applying them with the scale under the strain load. That is a brief outline of the normal test anticipated.

The boom will swing through such an angle that the weights may be directly spotted upon the scale platform during the unloading operation from the truck, and they can be picked up for reloading from almost any position in which they may be placed when removed from the second end test.

We are providing all of the safety factors that we know of, both for operation during the testing and operation on the highways. With our six-wheel job we have reduced the axle loading to a mini-

Digitized by Google

mum. That enables us to comply with the load limitation requirements in the majority of the States, and not to exceed the requirements in the other States by any more than is absolutely necessary. It also will give us good traction and roadability, we believe, and make for safety in operation on the highway. The weights are to be carried on the bed of the truck on a metal base with built-up mushrooms, something like traffic buttons, only rectangular in cross section, which will fit into recesses in the bottoms of the weights. We believe that that will give us ample anchorage of the weights during travel of the vehicle under any conditions which will be met in its operation. The weights are of somewhat special design in a few respects, but are largely conventional rectangular weights, except for the recess in the bottom to fit over the mushrooms.

The special equipment which will be carried in addition to the fifteen 1,000-pound weights will include a set of class C weights to be used on the scale, part of them being balanced out before the test is begun, so that errors both plus and minus may be determined by the addition or subtraction of known weights on the platform rather than by manipulation of a weighbeam.

I believe that you are all sufficiently familiar with the general type of this equipment, so that with that brief outline you will have a very good picture of what we propose to secure. The actual specifications for the job are rather extensive. I shall not attempt to go into them in detail. We tried to cover as many points as we could anticipate, and we found that we had covered just a few too many and had to recede from some of our requirements in order to get the job made. However, for purposes of reference these are of value, and will be available from time to time for the assistance of those officials desiring to consult them in the preparation of their own specifications.

The ACTING CHAIRMAN. On behalf of Ohio I am ready at this moment to go back and recommend to our director of agriculture that we make a request for this testing outfit to be used in Ohio.

(At this point, Dr. Briggs resumed the chair.)

The CHAIRMAN. Members of the Conference, I take much pleasure in presenting to you the Acting Secretary of Commerce, the Honorable Ernest G. Draper, who will address you on the work of the United States Department of Commerce.

ADDRESS BY HON. ERNEST G. DRAPER, ACTING SECRETARY OF COMMERCE

Mr. Chairman and members of the Conference, to you who are attending the Twenty-sixth National Conference on Weights and Measures, I extend a most cordial welcome. Secretary Roper has requested that I give you his personal greetings also and convey his regret that he is unable to participate in your meeting. It has been necessary, however, for him to leave Washington in order to represent the President at the opening ceremonies of the Texas Centennial Exposition in Dallas. He wishes me to say on his behalf that he is in wholehearted sympathy with the efforts this group is making to facilitate the orderly progress of the Nation's commerce. No one appreciates better than he that your work is essential in the preser-

Digitized by Google

vation of a basis of mutual confidence. Without this confidence the present-day structure of our business world could not exist.

This organization of weights and measures officials is a valuable adjunct to the Department of Commerce. I do not mean to imply that this Department should attempt to direct your activities. But I do mean, and I think you will agree, that we have a close mutual interest in numerous fields. This common interest is well illustrated in the close relationship which has existed, so I am informed, between the Conference and the National Bureau of Standards since the formation of your group in 1905. The success of your organization is attested in its growth from a mere handful of officials 31 years ago to your present attendance, representative of all sections of the United States. During these years the National Conference has earned an enviable reputation for thoughtful, fair, and constructive action upon the technical and other matters which come before you at your meetings. It is with pride, therefore, that we consider you as an essential part of the Department of Commerce family.

What is today the United States Department of Commerce was originally conceived as an organization "to promote the commercial interests of the United States." That original conception is always in our minds. However, there are now embraced in the duties of the Department of Commerce manifold activities which could not be foreseen by Gouverneur Morris, in 1787, when he proposed the creation of this Department. As members of our family, I believe you will be interested in phases of our service other than those of the Bureau of Standards with which you come into immediate contact.

The Bureau of Foreign and Domestic Commerce gathers and disseminates all kinds of statistical and factual information. To those engaged in domestic or foreign trade this Government service is invaluable. Studies are constantly being conducted in the field of production. Basic information regarding markets at home and abroad is likewise assembled as an aid to selling operations. Foreign offices, maintained in 34 commercial centers throughout the world, supply a constant stream of reports on foreign business activity. A wealth of information is thereby made available to business interests as well as to public agencies. This data supplies a much needed background for long-range planning and sound business judgment.

Another fact-finding agency of the Department is the Bureau of the Census. Contrary to popular belief, this Bureau does not confine itself to the taking of the decennial census of the population, although that still remains its largest single task. From the first decennial census of 1790 up to the year 1902, this Bureau had an intermittent existence. Expiring as each successive census was completed, it remained dormant until the next decade. In 1902, however, it became a permanent Bureau and is now beyond a doubt the largest statistical office in the world. Besides taking the decennial census, it is now continuously engaged in the compilation of statistics covering a wide range of subjects. In addition to the voluminous reports of the decennial census, this Bureau has an annual output of almost five thousand pages of statistical tables and text.

In the Bureau known as the Coast and Geodetic Survey, we have a different sort of fact-finding organization. This unit might be

Digitized by Google

called the "map and chart" bureau since the results of its research activities are largely embodied in the maps and charts which it issues. Extensive surveys of our coastline are made to provide basic data for navigators' charts. The magnitude of this task will be appreciated when I tell you that we have a seaboard of approximately 103,000 miles in length, a distance four times that of the world's circumference. There are the geodetic surveys of all inland territory also, supplying information for the wide assortment of maps in current use. Supplementing these observations are scientific studies of tides and ocean currents, magnetic surveys, and earthquake investigations.

Further aid to those engaged in ocean and inland water transportation is afforded by the Lighthouse Service and the Bureau of Navigation and Steamboat Inspection. The work of the Lighthouse Service was provided for in one of the first acts of Congress. Today this Service establishes and maintains lighthouses, lightships, radio beacons, and water-channel guides so essential to the safe and expeditious movement of ships. The Bureau of Navigation and Steamboat Inspection has as its primary functions the promotion of safety for ships and passengers.

In the course of your everyday work, you gentlemen are constantly associated with machines and mechanical assemblies of one kind or another. It is probable that you are well acquainted with the part played by the Patent Office in the development, manufacture, and marketing of such devices. For more than 125 years, it has been the function of that Bureau to secure to inventors the rights to their "brain children." By stimulating scientific progress and development this Bureau is making an important contribution to the lives of every one of our citizens. Besides the granting of patents, this agency likewise registers trade marks, designs, and labels used on merchandise entering interstate and foreign commerce.

Finally, in this short outline of some of the units comprising the Department of Commerce, I would mention the Bureau of Air Commerce. In the rapidly expanding field of air transportation, this Bureau plays an important part. Among the outstanding accomplishments is the development and maintenance of our Federal airways system—a vast network of more than 21,000 miles of lighted and radio equipped air lanes. Emergency landing fields are maintained to provide safe landing facilities at 50-mile intervals between regular airports. The inspection of aircraft and those who pilot commercial ships are likewise duties of this Bureau. Constant effort is being made in the field of research to improve the safety and facilitate the speed of air travel.

It is unnecessary for me to emphasize the important role which has been assigned to you in the drama of our Nation's business. Few of our people appreciate the extent to which we are dependent upon the standards of length, mass, and measure. Transmitted to you through the National Bureau of Standards, these standards are indeed fundamental to a wholesome commerce among our people. Once established, they are of little value, however, unless observance is universal among those who produce and sell.

Your work is, therefore, equally essential. We must depend on you in the exercise of your supervisory power to insure the constant and correct use of measurements complying with these standards.

Digitized by Google

The equitable determination of quantities of merchandise commercially exchanged is now virtually your responsibility. Believing it will be a source of encouragement to you, I have tried to give you some appreciation of the manner in which other closely allied agencies serve the business community. True, there is a wide variation in the tools that are used. But essentially we are bound together by one common purpose—to promote commerce and industry on a basis of mutual confidence and understanding among those who produce and those who consume.

As a final word, I would assure you again that the Department of Commerce believes whole-heartedly in the work which you are doing. We willingly pledge ourselves anew to cooperate with you to the fullest extent of our abilities in advancing this work and raising still further the high standard of your efficient service.

The CHAIRMAN. May I express, on behalf of the Conference, our deep appreciation of your kindness in being with us this morning and addressing us. In view of the many responsibilities placed upon Mr. Draper at this time, including not only his own normal work but that of the Secretary's office as well, we can not hope to have him remain with us. I will, therefore, call Mr. Tinkey to the chair.

Mr. SWEENEY. Before Mr. Draper leaves, may I suggest at this time that a rising vote of thanks be extended to the gentleman for the splendid address he has given us here this morning in representing the Department of Commerce?

(The motion was seconded, the question was taken by a rising vote, and the motion was agreed to.)

(At this point, Mr. Tinkey resumed the chair.)

DRAINAGE CHARACTERISTICS OF DISPENSERS FOR CANNED LUBRICATING OIL

By RALPH W. SMITH, *National Bureau of Standards*

Mr. Chairman and gentlemen, those of you who were here last year will recognize before you on the table the same group of dispensers which were exhibited by Mr. Lang in connection with his paper on canned lubricating oil.

The variety of types of these devices suggested to the Bureau that it would be an interesting thing to study the drainage characteristics of these types and learn how they differed and determine whether or not certain recommendations might be in order. You will recall that this more or less parallels the study along similar lines made upon lubricating-oil bottles in 1931.

The present study has not been an exhaustive one, but it is believed that it is adequate to form the basis for one or two recommendations. We had two primary objects in view: First, to determine the drainage characteristics of the cans themselves; and second, to determine the drainage characteristics of the dispenser units. A secondary, but more or less essential object was to determine the amount of oil contained in the cans inclusive of all oil that might adhere to the can after drainage; in other words, the amount of oil actually put into the cans by the refiner.

For ease of reference these dispensers have been arranged in two groups, three being of the "funnel" type and two being of the "con-

Digitized by Google

tainer" type. Let me emphasize that in everything I say, and in the equipment which is on display, we are referring only to type, and not to the product of any particular manufacturer. We have designated these dispensers by number to facilitate reference to them. The oil which we used was from 1-quart cans, and we had both SAE 30 and SAE 40 oil for purposes of study.

It will be interesting to you, perhaps, to observe that there is a variety in the kind of cut made by these various dispensers. (Cans opened by the several dispensers were displayed.)

We made an effort, in our study, to duplicate the commercial method of operation which would be followed by the filling station operator in dispensing lubricants. All of our determinations were made by weighing, not by measuring volumetrically. Drainage periods were timed from the beginning of the flow from the dispenser.

For each of the periods studied, separate determinations were made on the amounts retained by the can and by the dispenser. With the funnel type the flow was started with the dispenser held in normal manner, as a filling-station operator would hold it if he were dispensing direct to a crankcase. You will readily appreciate that some oil will be retained by the dispenser when it is used, and that some oil will necessarily drain away from the dispenser during the period elapsing between successive uses of the device in practice. For this reason, all of the observations on these three dispensers were corrected for a 10-minute period of drainage of the dispenser itself, because that was believed to be an inevitable condition of use; for this drainage, the dispenser was placed in what was felt to be the commercial manner on a drain rack.

In the case of the container type, a 10-second period was allowed after the can was punctured before the spout was turned down. That interval was determined by trial as the necessary period for the station operator to go through the manipulation of inserting the can in the dispenser, probably setting them on the pavement to puncture the can, picking them up, and getting ready to deliver the oil into the crankcase. The flow was started with the dispenser held in the normal manner. In the case of this type of dispenser the plotted observations are based upon a clean container, as distinguished from a slightly oily container in the case of the dispensers of the funnel type. Separate determinations were made to determine how much one of these dispensers would drain during a 10-minute period of drainage.

Our first step was to determine how much oil was contained in the cans. These particular cans contained, at 75° F., an average of 58.5 cubic inches of oil of SAE 30 grade, an overfill of about 0.75 cubic inch, or 1.3 percent. At 60° that would be equivalent to an overfill of only about 0.35 cubic inch, or 0.7 percent. For the SAE 40 oil at 75° F, the average content was 58.94 cubic inches, an overfill of about 1.2 cubic inches, or 2.1 percent; that would be equivalent to an overfill of about 0.85 cubic inch, or 1.5 percent, at 60°.

Figure 9 illustrates the amounts of oil retained in the cans at varying periods after the drainage started. The upper chart illustrates the SAE 30 oil, the lower one the SAE 40 oil, both charts being based upon results at 75° F., approximately laboratory temperature at the time the test was made.

Digitized by Google

It will be noted that the drainage characteristics of these various cans under any method of opening, as determined by the type of dispenser used, are practically the same. In other words, after 30 seconds of drainage, a can containing SAE 30 oil retained about 1 cubic inch, regardless of the type of opening made in the can; at the end of 60 seconds the amount retained was reduced to approximately three-fourths of a cubic inch. The average overfill of those cans is illustrated by the dotted line, indicating that after 30 seconds these cans were not sufficiently overfilled to deliver from the can itself into the dispenser the nominal amount of 57.75 cubic inches. After 60 seconds that condition was almost realized.

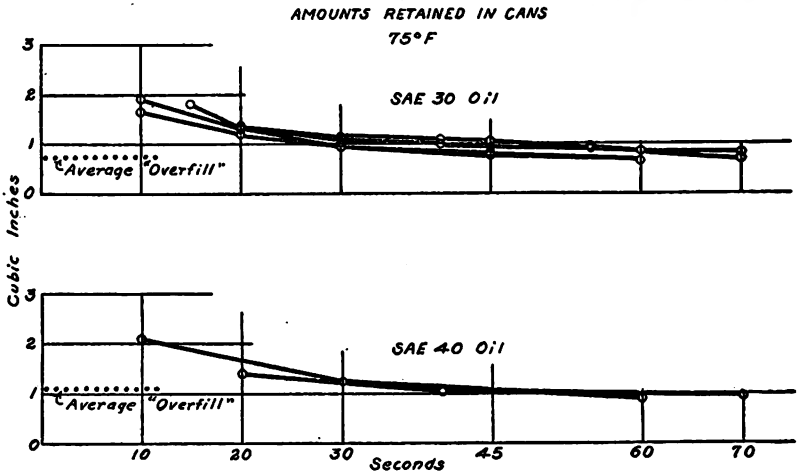


FIGURE 9.

In the case of the SAE 40 oil, a heavier grade, the drainage curves are similar, but slightly raised on the chart. After 30 seconds drainage about 1.25 cubic inches were retained; after 60 seconds about 1 cubic inch was retained. The average overfill of these cans is indicated by the dotted line, and corresponds fairly well with the amount delivered at 60 seconds; there is some failure to deliver full measure at 30 seconds.

In figure 10 are plotted the results obtained with the three funnel-type dispensers at 75° F. The upper curves illustrate the total amounts retained by both can and dispenser; the lower curves illustrate the amounts retained by the dispensers alone. The differences between corresponding curves represent, of course, the amounts retained by the cans. These results are fairly uniform, with no large differences between the results for individual dispensers, although some slight advantage appeared in the case of one of the dispensers. In this chart the solid lines indicate SAE 30 oil, and the broken lines indicate SAE 40 oil; it will be noted that the heavier oil was somewhat slower in getting out of the cans and dispensers, so that the total amounts retained and the amounts retained in the dispensers only, were greater in the case of SAE 40 oil than in the case of the SAE 30 oil.

Digitized by Google

Figure 10 shows that a total of approximately 1.5 cubic inches of SAE 30 oil were retained in the case of any one of the funnel-type dispensers at the end of a 30-second period after the main flow had started; at the end of 60 seconds the amount retained was about 1 cubic inch. In the case of the SAE 40 oil, the corresponding figures were approximately 2 cubic inches and 1.5 cubic inches, respec-

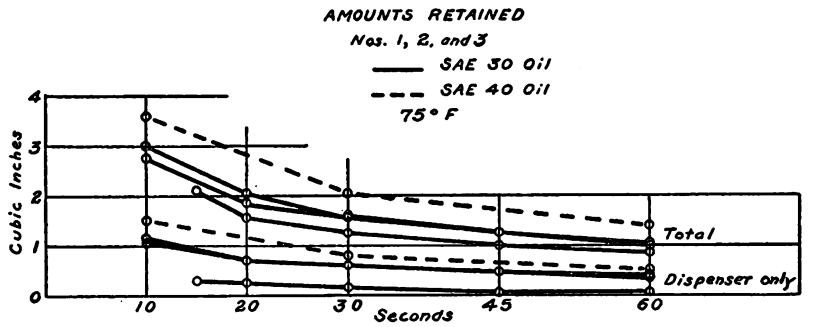


FIGURE 10.

tively. Expressed in another way, these results show that for full-measure delivery of SAE 30 oil at 75° F., there would be required an over-fill in the can of approximately 2.5 percent for a 30-second delivery period and 1.7 percent for a 60-second period; for SAE 40 oil, the corresponding figures would be 3.3 percent and 2.5 percent, respectively.

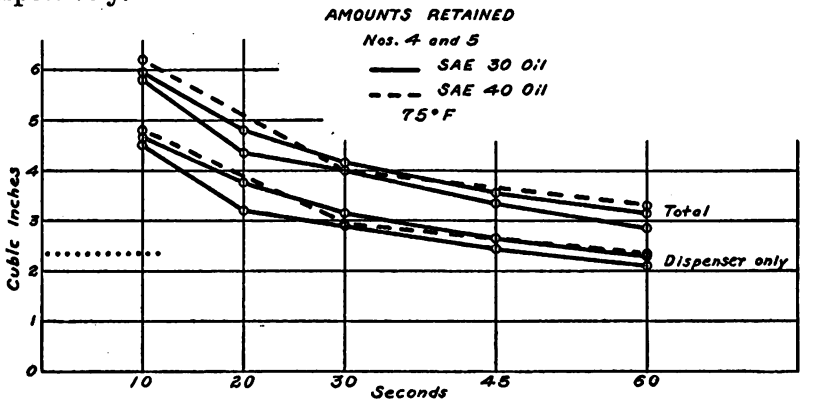


FIGURE 11.

In figure 11 are plotted the results on the two container-type dispensers. Again the total amount retained is indicated in the upper curves and the amount retained in the dispenser alone in the lower curves, solid lines representing SAE 30 oil and the dotted lines representing SAE 40 oil. Here the difference between the SAE 30 and the SAE 40 oil does not show up so prominently. There is, however, a noticeable difference between these two curves and the curves for the funnel-type dispensers, in that the total amount retained by the container types was very much greater than it was in the case of the

Digitized by Google

funnel types; but it is to be remembered that the results shown in figure 11 are all plotted upon the basis of a clean dispenser; that is, one from which all of the oil was drained before the delivery was started.

A separate study was made to determine the amount of oil retained in these dispensers after a normal delivery period, and that amount is indicated by the short, horizontal dotted line at the left of the chart. After the dispenser is once used and is wet with oil, if that oil is allowed to remain in the dispenser—as would be proper—it will compensate for an equal amount retained on the subsequent delivery; in other words, the chart would be plotted under these circumstances with the zero line where the dotted line now appears. In such cases the total amount retained by can and dispenser would, in effect, be something like 1.5 cubic inches for a 30-second delivery period or 1 cubic inch for a 60-second delivery period. By that it is meant that the difference between the amount of oil in the can and the amount actually delivered, under proper conditions of use of this dispenser, would closely correspond with the amount retained in the can and would be approximately 1.5 cubic inches after 30 seconds; after 60 seconds the amount would be reduced to approximately 1 cubic inch.

If, however, an operator deliberately turned the spout down between dispensing operations, and drained out of this type of dispenser all he could get, then the correct zero line is the zero line shown on the chart, and the shortage which would be anticipated—the difference between the amount of oil in the can and the amount delivered—would be about 4 cubic inches at 30 seconds, and about 3 cubic inches at 60 seconds.

Provided that this type of dispenser is properly used—that is, that it is not drained between deliveries—these results show that for full delivery there would be required an over-fill in the can of approximately 3 percent for a 30-second delivery and 1.7 percent for a 60-second delivery for either SAE 30 or SAE 40 oil.

As a purely collateral study to the drainage of these dispensers, we made a very brief study of the drainage characteristics of the flexible type of spout and the rigid type of spout for glass bottles. The purpose of this was to determine whether or not the flexible spout retarded drainage materially. Also, with these bottles, we made a few observations at low temperatures to determine the effect of a low temperature upon the delivery of oil from the bottles, upon the theory that the amount by which the delivery was slowed down in the case of the bottle would be proportional to what it would be in the case of a dispenser for canned oil. The results of this study are shown in figure 12.

There are not many data plotted here. The solid curve represents drainage characteristics with the rigid spout, and the broken curve represents results with the flexible spout. By reason of the broken curve being slightly higher than the solid one, it will be seen that the flexible spout showed up not quite so well as the other, but there is very little difference between them. At the right-hand side of this chart are shown the results at low temperatures. The circles represent individual observations, solid circles indicating SAE 30 oil and dotted circles indicating SAE 40 oil. It will be noted that some of these circles, representing observations made with the oil at a temperature in the neighborhood of freezing, are much higher on the

Digitized by Google

chart than the circles at the left, representing observations at 75°, showing that the delivery is materially slowed down when the temperature drops to a low point.

Based upon the results of this study, there are four brief recommendations which I wish to present for your consideration:

1. In no case should the serving period with any one of these types of dispensers be less than 30 seconds. Preferably it should be longer than that.

2. For the container-type dispenser, any drainage between operations is practically equivalent to a fraudulent method of operation. Drainage of this type of dispenser between deliveries should not be permitted.

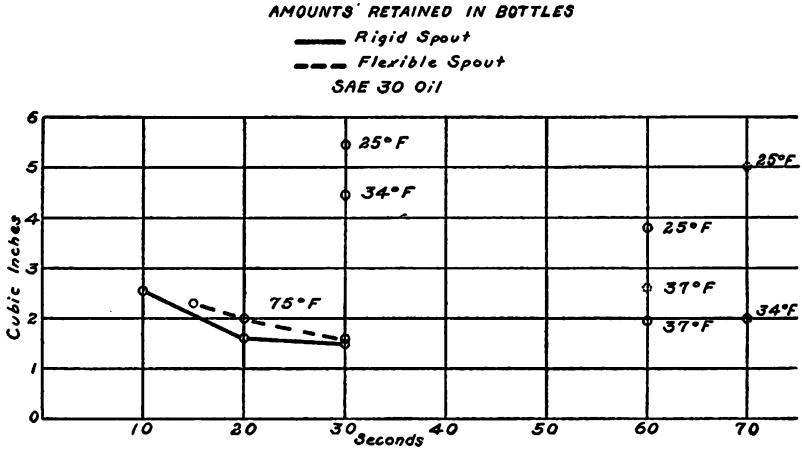


FIGURE 12.

3. During cold weather the oil in cans should be stored in heated quarters so that it will flow with reasonable rapidity when dispensed to the crankcase.

4. The overfill in the cans themselves should certainly be not less than 2 percent, and preferably should be 3 percent or a little more, in order to insure the delivery of a quart of oil into the crankcase when the motorist buys and pays for a quart.

DISCUSSION OF ABOVE PAPER

Mr. STROBRIDGE. Have you ever gone into a service station and used a stop watch on some of the operators putting oil into a car?

Mr. R. W. SMITH. I have timed them only in the case of my own purchases. I have found that they have taken not less than 30 seconds, and sometimes they have taken as much as a full minute. I have however, observed a lesser period than that when a purchase of more than 1 quart was being made; sometimes the time would be cut down to perhaps 10 seconds for the first quart, and then the second quart would be given a reasonable 30 or 40-second period for drainage.

Mr. STROBRIDGE. I have found, in making an investigation (the operator didn't know what I was doing) that the average, unless they inserted the bottle or funnel into the car and then went to cleaning

Digitized by Google

the windshield, was from 19 to 25 seconds. Very seldom did it run to 30 seconds.

Mr. BAUCOM. Is there any process of law or otherwise by which we can force an automobile oil manufacturer to put an excess amount in a can? If he sells a quart, can you make him put up more than a quart?

Mr. R. W. SMITH. I believe it is the general practice on the part of the refiners who are marketing canned oil to put in an excess amount. It is their desire to have full-measure delivery. I think that in all cases the cans are sufficiently large to permit at least a 3 percent overfill. Of course the refiner frequently does not sell to the motorist; the actual retail sale of the quart of oil is made by a filling-station owner. That might influence the character of regulation which you would have to draft in order to realize proper overfill. But I believe that you can accomplish the desired result without any difficulty in certainly the large majority of cases by enlisting the cooperation of the refiners, because it is already an established custom among the refiners to overfill their cans.

Mr. BAUCOM. I grant that is true.

The next point I want to raise is this: In your opinion do these dispensers aid in the perpetration of fraud, in that it is very easy to lift the spout before drainage is completed? I am inclined to feel that this is a device that could be construed as an aid in the perpetration of fraud, and that therefore it should be outlawed.

Mr. R. W. SMITH. The device is not, in itself, a measure; it is a dispensing unit. From the weights and measures standpoint, the question is how much oil is put into the crankcase. As to the extent to which a weights and measures official can impose restrictions on the use of a piece of noncommercial apparatus of this kind I would not care to express an opinion. My personal thought is that if there is evidence of misuse of this type of dispenser, it may eventually become necessary to do something about it. I have at hand no information that there is any serious misuse at the present time. If and when that condition develops, I think the matter should be given due consideration.

Mr. SAYBOLT. I think Mr. Smith's paper was very illuminating and very helpful, and his guess as to the practice of refiners in general I think is correct, in that overages are filled into the sealed containers at the manufacturing plant. It is my recollection that those overages vary, based on the consistency of the oil. That is, the thinner the oil the lower the percentage of overage, and the thicker the oil the greater, because both the cohesive and adhesive qualities of the product are increased as the consistency or viscosity of the product increases.

The tendency of the buying public has undoubtedly been in the direction of the sealed container, and I have no doubt that if the question were presented fairly and squarely to the millions of motorists crossing this country, they would perhaps prefer the practical proof of quality in a product and would not object to the loss of the small percentage of retained product in either the can or the can and container, rather than to run the chance of substituted, diluted products which is so very possible in bulk operation.

A point occurs to me in relation to the chart shown by Mr. Smith, illustrating that at low temperatures the percentage retained was

Digitized by Google

higher on the higher SAE-bodied oil. It is rather common practice on the part of the motorist, as you undoubtedly know, to use the thinner oils in the winter time, and I think, therefore, that it is quite likely that the percentage of retained product retained by the dispenser and the can would probably equalize itself season for season.

I am quite sure that you gentlemen feel that the oil companies have no desire whatever to give short measure. We hope that the overage filled into the can takes care of that situation. There would be more expense and more trouble and more red figures if the oil companies attempted to collect the ounce or two that might be retained and carry it back to the refinery and fill it in again than there would be in giving full measure.

Now, so far as the legality of the transaction is concerned, it occurs to me that we could take care of the proper protection of the motorist if, after emptying the container, we offer him the mutilated container with the retained oil in it, and let him take it home and drain it himself.

Mr. BOYLE. I would like to say, from my observation, that the amount of oil retained in the can is greater than the amount retained a few years ago, when the use of pumps was more common. I might add that the retention of oil is sometimes deliberate, and is facilitated because the buyer can not see the amount of oil that is held back; in several instances I have found a number of cans setting up on a funnel being drained, the oil not to be given to the customer but to be used in the station attendant's own car. In the case of bottles, I have found many slack filled, and the explanation was that if I would come around an hour or two later the sun would have caused an expansion and changed the volume, and the level of the oil would be up to the proper marking. In the winter time the bottles were placed near a stove to become heated, to take advantage of the expansion.

The ACTING CHAIRMAN. Are there any further questions?

We are fortunate, in Ohio, in having a law that demands net weight or measure at the time of sale, so in the case of canned oil the can must deliver what it is marked.

Mr. HOLBROOK. Mr. Chairman, ladies, and gentlemen, I think that the preparation and submission by Mr. Trump, controller of the Standards Department of the Board of Trade of Great Britain, of the paper which I am about to read to you is good evidence of international cooperation in weights and measures matters, and is a very friendly action on the part of the English officials.

WEIGHTS AND MEASURES ADMINISTRATION IN GREAT BRITAIN

By R. J. TRUMP, *Controller, Standards Department, Board of Trade of England*

Introduction.—This paper is designed to provide a summary of the law and practice governing the control of weights and measures in Great Britain, that is to say, England, Scotland, and Wales. It does not apply to Ireland, where the matter is under the independent jurisdictions of the Irish Free State and the State of Northern Ireland, respectively. At the time of the setting up of these two States. the laws then in force in Great Britain continued valid in Ireland, but since that date certain modifications on both sides render the position no longer uniform. Similarly, so far as the various domin

Digitized by Google

ions and colonies are concerned, there is independence of jurisdiction; and although certain measures of coordination in respect of the principal standards are in force, and a certain degree of collaboration takes place, nevertheless wide differences in law and administration exist. Obviously over so wide a field, having regard to the differences in local circumstances, and the varying mentality and customs of so many races, no close degree of uniformity would be practicable.

The law of weights and measures was last consolidated in the act of 1878, which still remains the act by which the main administrative machinery is governed, although it has been amended on a number of occasions as later developments have rendered it necessary. It is perhaps preferable not to follow through these changes, but to proceed at once to set out the position as it now stands.

Primary Standards.—The first step in any official system of control of weights and measures is to establish the standards from which the units are derived, and to provide means by which authentic series of standard weights and measures are put into the hands of the officers whose duty it is to control the appliances used by traders.

Two systems of weights and measures are admitted by the law and these are usually described as the imperial and the metric systems, respectively. The standards of the imperial system are the yard, pound, and gallon, of which however only the yard and pound are primary standards, the gallon being secondary or derived. The present primary standards were legalised in 1855, to replace the previous standards, which were lost in the fire which in 1834 destroyed the Houses of Parliament where they were then kept. A number of copies (parliamentary copies) were legalised at the same time, and statutory provision made for periodical comparisons between them. If at any time the primary standards, which are in the custody of the Standards Department of the Board of Trade, are destroyed or damaged, the copies will be available to reproduce them.

There are now five such copies of the yard and pound. One set is kept at the Royal Mint and one at the Royal Observatory at Greenwich. One set is deposited with the Royal Society, an association founded in the reign of Charles II for promoting the advancement of knowledge. The fourth set is enclosed within the wall in the Houses of Parliament, and the fifth set, of later construction, is at the disposal of the Board of Trade for use in precise comparisons, thus obviating the necessity for referring direct to the primary standards themselves.

The primary standards and the parliamentary copies are similar in construction and material. The yards are bronze bars about 1 inch square in section, and some 38 inches along. Near each end a circular well is sunk to about the depth of the bar, and in the bottom of the well a small gold plug is inserted. Upon these plugs the defining lines are drawn. The "yard" is defined as the distance between the lines on the imperial standard at 62° F. The pounds are cylindrical in form, with a groove near the top in which a lifting-fork can be inserted. They are of platinum, except for the Board of Trade copy, which is of platinum alloyed with iridium. The "pound" is defined as the weight of the primary standard pound in vacuum. (The distinction between mass and weight was not clearly recognized at the time the pound was legalised.)

Digitized by Google

The gallon is defined not on the basis of cubic content, but by the fact that, under certain standard conditions, it contains 10 lb. of distilled water. The definition is not perfectly precise, but in practice the uncertainty is too small to cause any difficulty. This unit, unlike the yard and pound, which have remained substantially constant for centuries, dates only from 1824, when it was introduced to replace a number of different measures which were in use for different purposes, although all of them had apparently been originally alike. One of the measures so replaced was the "wine gallon", which was fixed in 1707 (Anne Reg.) at 231 cubic inches, just as is the American gallon today. This is about one-sixth smaller than the British imperial gallon. From the latter all measures of capacity, whether for dry or liquid goods, are derived. These derived measures, although similar in name to those in use in the United States, are therefore not equal to them in value.

The units of weight and linear measure do not differ in any essential particular from the units in customary use in the United States, except that the ton consists of 20 cwt of 112 lb. A weight of 100 lb is called a cental, and the terms "long ton" and "short ton" are not recognized by law.

The metric system is also legal for most, but not quite all purposes—for instance, it may not be used in selling milk—and there are also restrictions upon its use in connection with made-up packages of foodstuffs. Actually, however, except in connection with export trade, it is very little used for the sale of goods.

The weights and measures of the metric system follow rigidly on international lines. The law which legalizes the system states only that metric weights and measures shall be "derived" from the British national prototypes of the kilogram and meter, but gives no directions as to whether the known errors of these two standards as against the International Prototypes shall be taken into account. In practice, these errors are in fact always allowed for, and arrangements are now made for these standards to be taken to Sevres at intervals to be retested against the standards of the Bureau International des Poids et Mesures, so that any necessary corrections can be applied.

It will be seen that the two systems, imperial and metric, are independently defined, but for convenience in working, an order of the Privy Council has been issued, containing a list of equivalents which may legally be used in trade.

Secondary and Derived Standards and Their Verification.—By an arrangement between the Board of Trade and the Department of Scientific and Industrial Research, The National Physical Laboratory at Teddington now look after the scientific side of the verification of the standards, and the Standards Department of the Board concentrate upon the administrative aspect. The Laboratory therefore now carry out the periodical comparisons of the primary standards of the yard and pound and their principal copies, as well as conducting the tests necessary to build up from them a complete set of all the multiples, submultiples, and derivatives which constitute the denominations of standards of length and weight which are legal for use in trade. From these "first derivatives" the Standards Department verify the measures of capacity, and the necessary reference and working standards which are required for their own use in testing the "local

Digitized by Google

standards" which are employed by the various inspectors of weights and measures (sealers). The inspectors also have their own working standards, which they themselves verify against their local standards. The periodical testing of the whole chain, from the primaries downwards, is provided for either by law or by statutory regulation.

The parliamentary copies must be compared with each other every 10 years, and with the primary standards every 20 years. The Board of Trade secondary standards must be compared with a parliamentary copy or with each other every 5 years. The inspectors' (local) standard weights must be reverified every 5 years, and their measures every 10 years. From these they must retest their own working standards every 6 months, and adjust them if necessary.

General Provisions of the Law.—By reference to the primary standards, all the units of weight or measure which may be employed as the basis of trade transactions are defined, and in order to secure uniformity, it is made an offence to employ any others. The basic word, running right through the acts, is the word "trade", which is defined broadly speaking, so as to include any transaction based upon weight or measure. It includes, not only the sale of goods, but the charging of tolls or duties, the carriage of goods, the performance of work, and the payment of wages, and, in general, any transaction calculated in relation to weight or measure. It does not cover transactions where weight or measure do not form the basis upon which payment is made. It therefore excludes sale by price or money's worth, without reference to weight or measure, and also excludes sale by number or count. Machines used in factories or works for the purposes of internal records only, are not in use for "trade" in this sense; nor are household machines as a class subject to control. Machines for ascertaining the weight of the person are subject to jurisdiction only in a few special areas under the provisions of acts of local application only. All transactions by way of "trade" must be conducted in terms of one of the legal units of weight or measure—that is the units of the imperial system as defined in the acts, or in the terms of the metric units.

All weights, measures, and weighing instruments for use for trade must be stamped by an inspector, acting in accordance with regulations issued by the Board. Once duly stamped, they are legal throughout the kingdom until they become inaccurate. Measuring instruments in general are not subject to verification, but the Board of Trade have power to impose this obligation by regulation (subject to the concurrence of Parliament) upon such classes of instrument as they may specify. At present, only instruments for the measurement of liquid fuel (which includes motor spirit) and lubricating oil in quantities not exceeding 20 gallons have been so treated.

Inspectors are empowered to enter premises where they have reason to believe that articles subject to their jurisdiction are to be found, in order to examine and test them if they desire to do so. They may also stop carts carrying coal in order to ascertain, if necessary, that the load is as described on the driver's weight ticket.

In addition to the control of apparatus, there are also provisions governing the transactions themselves. Coal, and certain articles of food such as bread and potatoes, must be sold by net weight; others such as butter may be weighed with the wrapper if it does

Digitized by Google

not exceed a certain proportion of the gross weight. Loaves other than those of fancy bread, if more than 12 ounces in weight, must weigh 1 pound, or some multiple of a pound. Milk except when sold by the pennyworth, or for consumption on the premises of the seller, must be sold in multiples of half a pint. There are also restrictions upon the weight of made-up packages of certain of the commoner articles of food. Short weight or measure in connection with the sale of any articles of food is an offence, but this does not apply in respect to other commodities, except coal.

The acts provide for the penalties necessary for enforcing the law, for instance, for the possession, sale or use for trade of incorrect appliances; for forgery of stamps, obstruction of inspectors, for offences in connection with the sale of food, and so on. Where the court finds that there is an intention to commit fraud, the penalty may include imprisonment.

Prosecutions may be conducted by inspectors of weights and measures, and are usually dealt with by the magistrates in the local courts, subject to appeal in the usual course.

Administrative Authorities.—As is the case in so many other branches of government, the control of weights and measures in Great Britain is divided between the central and the local authorities. By the central authority is meant the Board of Trade, responsible to Parliament through its Minister, the President of the Board. In particular, it includes the Standards Department of the Board, through which the detail work of administration is conducted. The term "local authority" is not so easy to define—in fact, in different phases of local government it has different meanings. For present purposes, it may be sufficient to say that, so far as the weights and measures acts are concerned, only the counties and the boroughs come into question.

The counties constitute the largest of the local areas, their boundaries having remained largely as they happened to be fixed in the distant past and they vary widely in area and population. With a few exceptions, the council of every county constitutes a separate local authority for the purposes of the weights and measures acts. The exceptions arise from the fact that, in a few cases, a county (as for instance Yorkshire) is divided into two or three divisions, each of which has its own council, while in others, two or more counties have combined, as they may do, to administer these acts as if they were a single area. Excluding London, with its very large population in a small area, some five or six counties have a population of between one and two millions, while there are several with a population of only about 20,000 or less.

Next to the counties come the boroughs, but at this point a little complication arises, for although Scotland has been joined to England and Wales under one Crown since 1603, and one Parliament since 1707, much of her own domestic law and local organization has been retained, in a form rather different from that prevailing, as we say, "over the border."

So far as England and Wales are concerned, a lower limit of population of 10,000 was set by an act of 1888 for a borough competent to administer the weights and measures acts. Many boroughs which are qualified to take up this duty have not done so, but have left the

Digitized by Google

administration to be carried on by the county, and others have given it up.

There has in fact been a steady tendency for the smaller boroughs to relinquish their powers, either by merging them into those of the surrounding county, or by appointing the same inspector. The trend of recent times towards new types, and larger and more complicated appliances, and the need for more extensive and costly equipment for the use of the inspector have made it increasingly difficult for the smaller authorities to carry out the work.

So far as Scotland is concerned, the position is a little different. In addition to the geographical counties, every "burgh" is in theory entitled to administer the weights and measures acts. There are nearly 200 of these burghs, some of which have a population which is counted only in hundreds. In practice, only a very few appoint their own independent inspector. A number retain their powers only to an extent which almost automatically involves their adopting the inspector appointed by the county in which they lie.

In sum, while there may be perhaps about 500 local authorities entitled to administer the acts, only about 270 maintain independent jurisdictions. Of these, the larger areas may appoint several inspectors, the smaller may share a single inspector. The total number of inspectors actively employed is rather less than 700, but as will be understood, the number varies from time to time.

Distribution of Duties.—The distribution of powers and duties between the central and the local authorities is such as to give the former the task of coordinating and unifying the work of the inspectors, who are appointed by the latter. The Board are responsible for the verification of their own standards, and also those of the inspectors. Weights and measures which may legally be used in trade are limited to certain sizes (denominations), and every legal denomination must be represented among the Board of Trade standards.

Although in certain cases, inspectors may verify their own local standards against a set which is still legal, this course is very seldom adopted, and these standards are almost always verified by the Board. A few years ago a voluntary system of *in situ* verification of inspectors' standards at their own offices was introduced, and most of the local authorities have adopted it. This service has been carried on by means of a motor van fitted up to carry all the necessary apparatus, much of which was specially designed for the purpose. It tours the country as required, and deals with all the inspector's equipment on the spot. New standards, and the standards of those authorities who have not adopted the scheme, are verified at the central office of the Standards Department. Fees are charged to cover all verification work, and an additional charge is made for the *in situ* service.

In order to secure uniformity of procedure, the Board of Trade are empowered to issue regulations which all inspectors are bound by statute to obey. These regulations are in the main technical, in that they lay down certain requirements as to materials, form, and construction, and prescribe the tolerances for the various types of weighing and measuring appliances which are subject to control. In conformity with these regulations the inspector applies his stamp—without which no such article is legal for use in trade—or obliterates

Digitized by Google

an existing stamp as the case may be. Once stamped by any inspector, any appliance is legal throughout the country, "unless it is found to be false or unjust."

The regulations also require the local authorities to provide adequate offices and equipment for the use of their inspectors, and to see that the inspection of traders' premises is periodically carried out.

Another essential factor in securing uniformity is the control of novel designs. Before any instrument having any novel features can be stamped by an inspector it must first be submitted to the Board for examination and test to see whether its material and principle of construction is such as to facilitate the perpetration of fraud. This examination is not therefore primarily a test for accuracy, although of course accuracy has to be looked at. The principal point to which attention is given is as to whether it can be tampered with, or so manipulated while it is being used that the customer is reasonably likely to be deceived; similarly, any feature which permits of an instrument being readily made incorrect, in a way that would not be immediately obvious, is also looked for. Attention is also paid to consistency of performance over a period of time, or under different conditions, and so on.

If the Board are satisfied with the result of their examination, they issue a certificate; but if they decline to grant such a certificate, no appliance made in accordance with that pattern is legal for use for trade, nor can it be stamped by an inspector. It will be seen that the Board deal only with the pattern. The local inspectors test the instruments in actual service, with the aid of descriptive Notices which are issued to them by the Board on the completion of their examination of the pattern.

The Board have the power to decide in cases of dispute between the Inspectors and others as to the meaning and construction of the regulations, and as to the methods of test applied by an inspector. They may also be referred to by the courts when the accuracy or otherwise of any appliance is in question. Formal reference of such questions to the Board is, however, rarely made. Inspectors are in constant and close touch with the Department, who are therefore in a position to advise them at an early stage, so that disputes seldom come to a head.

The inspectors, for their part, have their own association, which arranges an annual meeting, and there are also some half dozen district associations, which usually meet twice a year for the reading of papers and discussions. These meetings also greatly assist in securing uniformity of administration.

While the local authorities appoint the inspectors, it is a necessary condition that the person appointed shall hold a certificate of qualification. These certificates are issued by the Board of Trade on the results of an examination held by them to ascertain whether candidates possess "sufficient practical knowledge" of the duties of an Inspector. Candidates are expected to qualify in elementary physical and mechanical science, and the law and practice of weights and measures, and to pass a practical and oral test covering as far as may be the active side of the work. Only candidates nominated by a local authority competent to appoint an inspector can be given certificates of qualification.

Digitized by Google

The local authorities are required to appoint a sufficient number of inspectors, and see that the administration of the acts is properly carried out; to obtain local standards sufficient for the needs of the district, offices, and equipment, scale beams and balances, tools and inspection kits for their inspectors. They are also responsible for the detection of offences, the prosecution of offenders and the enforcement of the law generally within their boundaries. The work is of course actually carried out through the inspectors, who although they are subject in general to the instructions they receive from their own authorities, are themselves personally responsible for the safe keeping of their standards, and for the due observance of the Board of Trade regulations. Fees are taken by inspectors for all verification work, on a scale fixed by Order at the instance of the Board of Trade, and paid over to their Local Authorities. Periodical reverification of weights and measures is not compulsory.

There is no provision for the general supervision of inspectors and the Board have little power of direct intervention in cases where the weights and measures acts are not fully and properly enforced. They may institute an enquiry in any area, but it is doubtful how far they can compel the attendance of witnesses, or enforce any reforms which the enquiry may show to be necessary. The success of the Board and the inspectors in securing uniformity of practice largely depends upon the maintenance of a cordial relationship between their officers and the officers of the various local authorities, and fortunately little difficulty is experienced in this direction. The system of dual control gives rise to certain anomalies which are not met with in countries where the weights and measures system is wholly centralized, but good-will and cooperation go far towards overcoming them.

The ACTING CHAIRMAN. I consider that a very splendid paper. It appears that Great Britain has its problems of weights and measures the same as the United States. I believe that there are a number of things there that we can learn with profit.

GENERAL CONSIDERATION OF SUBJECTS OF INTEREST AND QUESTIONS BROUGHT UP FOR DISCUSSION BY OFFICIALS

The ACTING CHAIRMAN. At this time officials should bring before the Conference for consideration all subjects of interest to them not elsewhere listed on the program. At the request of certain weights and measures officials, a considerable amount of program time is being reserved for this item, so as to provide ample opportunity for full discussion. All officials are urged to participate.

Mr. GRIFFITH. While you have all of the exhibits of canned oil and dispensing devices there, I think it would be of some interest to the Conference to be acquainted with another type of dispensing device used by one of our major oil companies in the dispensing of its product. It has come to our attention that substitutes are even being made for a dependable product in what is supposed to be a bottle which cannot be tampered with. If you will grant Inspector Crockett, of Baltimore, a few minutes, he will demonstrate for the benefit of those present how we discovered what was being done.

Mr. CROCKETT. Gentlemen, in making this piece of apparatus [exhibiting apparatus] I confined myself to the actual materials that you

Digitized by Google

will find in a filling station. Everything but the air pressure which operates this you will find there. This is the bottle which I desire to refill. You have all seen them in filling stations. Now we find that you don't have to have this expensive piece of apparatus ordinarily supplied. Any gentleman in a filling station, of an inventive turn of mind, which lots of them have, can construct such a piece of apparatus as I have here.

This is just an ordinary pump [exhibiting] such as is used in putting air into a football bladder, and this cut-off valve is nothing more than the cut-off valve that you find on any automobile. (Mr. Crockett demonstrated the refilling of the bottle with oil.) I have to fill it slowly, because if I put too much pressure on it we might have an avalanche of crankcase oil. All you have to do is apply the pressure to fill the bottle with crankcase oil.

The gentlemen who make the standard refilling apparatus go to a lot of expense and trouble, but they still don't take into consideration the man in a garage who has an inventive mind.

(At this point, at 1 p. m., the Conference took a recess until 2 p. m.)

Digitized by Google

SIXTH SESSION—AFTERNOON OF THURSDAY, JUNE 11, 1936

(The Conference reassembled at 2:20 p. m., at the National Bureau of Standards, Dr. Lyman J. Briggs, President of the Conference, in the chair.)

The CHAIRMAN. The Conference will please be in order for the afternoon session.

Is Mr. Lang in the room? If so, I would like to have him take the chair. (Mr. Lang was not present.)

You will recall that the matter of amendments to the Model Law was postponed for discussion as the first order of business in this Thursday afternoon session. I will ask the secretary to present those amendments.

PROPOSED AMENDMENTS TO MODEL STATE LAW ON WEIGHTS AND MEASURES—Continued [4]

Mr. HOLBROOK. These amendments were distributed yesterday to the delegates and you have had the opportunity to study them.

Section 6 of the Model State Law on Weights and Measures prescribes certain duties of the superintendent of weights and measures. It probably is unnecessary to read the section in full; the latter part is to this effect:

> The superintendent (commissioner) shall issue from time to time regulations for the guidance of county and city sealers and said regulations shall govern the procedure to be followed by the aforesaid officers in the discharge of their duties.

As I mentioned the other day, there is no specific provision in the Model Law giving the State superintendent the power to issue specifications and tolerances in relation to commercial apparatus. An amendment is now proposed which gives to the State commissioner that authority in specific terms. The amendment is to the effect that the section which I have read in part, be amended by adding at the end thereof the following:

> The said regulations may include specifications and tolerances for all weights, measures, and weighing and measuring devices of the character of those specified in section 8, which shall be designed to eliminate from use, without prejudice to apparatus which conforms as closely as practicable to the official standards, those which are not accurate, which are of such construction that they are faulty—that is, which are not reasonably permanent in their adjustment or which will not repeat their indications correctly—or which facilitate the perpetration of fraud. For the purposes of this act apparatus shall be deemed to be correct when it conforms to all applicable requirements promulgated as specified in this section; other apparatus shall be deemed to be incorrect.

There are several amendments, Mr. Chairman, but in view of the fact that they are all individual it would seem advisable to take each up as it is read.

Mr. BAUCOM. Mr. President, I move that that be adopted.

(The motion was seconded, the question was taken, and the motion was agreed to.)

---

[4] See p. 32.

Digitized by Google

Mr. HOLBROOK. The second amendment: It is proposed to add a section to the Model Law in relation to slack-filled and deceptive packages. Again briefly, to bring the subject to your attention, I may say that some of the States have legislation of this character. It is not at this time a requirement of the Federal Food and Drugs Act. Bills have been presented in Congress from time to time during the last few years to provide that it shall be misbranding to put up an article in a deceptive or misleading package. The provisions are now carried in the proposed amendments to the Food and Drugs Act which is before the present Congress, in the bill popularly known as the Copeland bill. The wording adopted here is based upon the language now used in the Copeland bill, although it is not identical with it.

It is proposed, then, to add a new section to the Model Law, to be known as section 23–a, and to read as follows:

Section 23–a. It shall be unlawful to keep for the purpose of sale, offer or expose for sale, or sell any commodity in package form if its container is so made, formed, or filled, or if it is so wrapped, as to mislead the purchaser as to the quantity of the contents; or if the contents of its container fall below the standard of fill prescribed by regulations promulgated as provided in this section. For the effectuation of the purposes of this section the superintendent (commissioner) of weights and measures is hereby authorized to promulgate regulations fixing and establishing for any commodity in package form a reasonable standard of fill of container.

Now a purely formal amendment is that if this section is adopted, then in the second paragraph, first line, of section 23, the word "section" shall be stricken out, and the word "act" shall be inserted in lieu thereof, inasmuch as the present definition of the words "in package form" is limited to apply to one section, and those words must also apply to this section if it be adopted.

Mr. SWEENEY. The whole intent and purpose of this section, Mr. Holbrook, is to make illegal the action on the part of some dealers who are putting up spices and things of that kind in packages which give the public the impression that they are getting a much larger package than they are really getting?

Mr. HOLBROOK. The amount of commodity appears to be much larger than the amount actually delivered. Spices may serve as an illustration. During the World War spices became very high in price. The quantity of spice in the retail package was considerably reduced, but the packages were kept the same size as formerly; in case they were required to be marked, the net weight was correctly marked thereon, however. The fact that the packages of spices were not filled often did not come to the attention of the purchaser because they were usually sold in cans with a sifting top, and the package was not opened. That is an example. There are other packages that you have seen from time to time; for instance, false-bottom packages, and packages which, by various devices, are made to look very much larger than the contents warrant. This section is aimed at such goods. There may be other packages which are simply slack filled or incorrectly filled, and this the purchaser may discover when he buys and opens them, but at that time the transaction is complete.

Mr. SWEENEY. Mr. President, I move you, sir, the adoption of this section.

Mr. HOLBROOK. I think this section probably deserves a good bit of consideration, because it is not part of the Federal law, although

Digitized by Google

it may be. We can not tell. We can not tell whether or not the Copeland bill will be enacted, and we can not tell whether or not this provision will be in the Copeland bill if it is enacted. But some of the States now have this law, and I think that you should decide whether you want to recommend it as a part of the Conference program.

Mr. BAUCOM. I fully endorse the first part of this, but we meet here to bring about a simplified and uniform system. If we give power to make this regulation to every commissioner in the United States we are liable to have many regulations in the different States. It is going to make it mighty difficult for a man to pack his commodity and make it applicable to any State. Do we want to give that power to him, or should we back up a little and declare the law? I bring that out because we don't want to have one set of specifications in North Carolina and another in New York and another in New Jersey regulating the same commodity. I say this for the benefit of the packers, and I would like to have that carefully thought over before we finally act on the latter part of this paragraph.

Mr. MCBRIDE. If the Federal Copeland bill became law then this provision would not apply. If we vote in favor of this proposition and the Copeland bills fails of passage, we will have made some progress; otherwise we will have no control over the standard of fill. I think that favorable action should be taken on this proposed amendment which will give us power in the event the Copeland bill does fail.

Mr. HOLBROOK. If the Copeland bill does not become law, then this would fully apply in the States in which it was passed, of course, but in no others. If the Copeland bill does become law, then this section would take care of goods put up and sold in the State which did not enter into interstate commerce; also this section is general in nature, referring to all commodities, whereas the Copeland bill refers only to "foods, drinks, drugs, and cosmetics."

Should the Copeland bill pass and the regulations be issued by the Secretary of Agriculture in conformity with the act, it would certainly be highly desirable that the State superintendent of any State give careful consideration to those regulations in issuing his own, because those regulations would inevitably govern all food in package form which enters into interstate commerce in any event.

Mr. LEVITT. There is quite a little difficulty in setting a definite fill for package goods. We ran into that in Illinois. We had complaints on soap flakes being put up in packages. We took it up with the packers. We found that they have a machine that fills those packages. One grade of soap flakes is bulkier than another grade, but in order to facilitate the packing—to keep from having different sized packages and to have uniform shipping cases—they use the same package. I think we ought to be a little careful as to just how far we go.

Another thing on spices. The spice people put out a 1-ounce package of spice. Pepper will probably have more bulk than nutmeg or cinnamon, but they want to have uniform packages so that when the packages are placed in the pantry they are of uniform size. This provision gives the superintendent discretionary power, and he can really be unreasonable in exercising his discretion. There should be

Digitized by Google

something done about that. I am in favor of a fill law, but I don't think we ought to be arbitrary about it.

Mr. HOLBROOK. This is just the kind of discussion that I wanted to promote. If you do not believe that a State should pass such a law as this, the proposed amendment should be rejected; but I thought it was extremely advisable to get the consensus of the Conference in that regard.

Mr. GRIFFITH. The provision merely provides the power to make the regulations. It is not mandatory. If you don't make them you don't subject anybody to their enforcement. As to the sizes of packages of spices being uniform, it is known that each manufacturer selects a different package, of different size and different color, so that there is no uniformity. Certainly it does promote the better regulation of commodities—not only foods, as you so well remarked, but others—and the public as well as fair trade are protected, by providing that packages shall be filled within a reasonable distance of their top, rather than slack filled. It is a step forward, I think, in assisting trade and protecting the consumers.

Mr. ACKERMAN. Does the Copeland bill specify any certain amount of fill?

Mr. HOLBROOK. The Copeland bill is similar in wording to this; the Secretary of Agriculture is authorized under the Copeland bill to promulgate such regulations as are specified herein. I believe also that a committee is provided for which shall give consideration to the matter and make recommendations to the Secretary. I can read you the provision, if you like.

Mr. ACKERMAN. I wouldn't care for that. We tried to pass an ordinance of this kind in Minneapolis 4 years ago. We got a lot of opposition from the packers. We discovered packages containing 20 ounces to the package, and other packages sold in the cut-rate stores carrying only 16 ounces to the package and selling for 1 cent less, so that if you bought the cheaper package you were actually paying more for the commodity. We are interested in passing this same kind of regulation.

(The question was taken, and the motion was agreed to.)

Mr. HOLBROOK. The next amendment is in relation to bread. It is proposed to amend section 26 to make it read as follows:

SEC. 26. The standard loaf of bread shall weigh one pound, avoirdupois weight. All bread manufactured, procured, made, or kept for the purpose of sale, offered or exposed for sale, or sold, in the form of loaves, shall be one of the following standard weights and no other, namely, one pound, one-half pound, one and one-half pounds, or multiples of one pound, avoirdupois weight: *Provided, however*, That rules and regulations for the enforcement of the provisions of this section, not inconsistent herewith, shall be made by the superintendent (commissioner), and such rules and regulations shall include reasonable variations or tolerances, in excess only, or in excess and in deficiency, which may be allowed: *And provided further*, That the provisions of this section shall not apply to biscuits, buns, crackers, rolls, or to what is commonly known as "stale bread" and sold as such, in case the seller shall at the time of sale expressly state to the buyer that the bread so sold is stale bread. When twin or multiple loaves are baked, the weights specified in this section shall apply to each unit of the twin or multiple loaf.

It shall be unlawful for any person to manufacture, make, procure, or keep for the purpose of sale, offer or expose for sale, or sell, bread in the form of loaves, which is not of one of the weights specified in this section within such variations or tolerances as may be fixed by the superintendent (commissioner)

Digitized by Google

as provided herein. For the purposes of this section, bread shall be deemed to be in the form of loaves whether or not the loaf is wrapped, and whether or not the loaf is sliced.

Standard-weight bread laws recently passed provide that for a certain period of time after baking, bread shall not weigh less than the standard weight provided for. Under this section as originally worded the commissioner is required to make tolerances "in excess and in deficiency." The Supreme Court of the United States has upheld the recent Nebraska Bread Act, in which the tolerances for a period were in excess only; thus the Supreme Court has put the seal of its approval on tolerances which are solely in excess. In order to allow the superintendent to specify such tolerances, the four words "in excess only, or" are proposed to be added to the section after the words "variations or tolerances" in the first proviso.

The last sentence of the section as read, is new material. At the time this section was first passed, wrapped bread was much less common than it is now, and sliced bread in the form of loaves was practically unknown. It has been contested in some States whether the wrapping of bread does not make a package out of the bread, in which event it might be marked with any weight in accordance with the package goods law, and the standard-weight requirement would be broken down. This is added to clear up the fact that wrapped bread is still bread in the form of loaves within the meaning of the section, as is sliced bread also.

Mr. TINKEY. I think there has been one vital point omitted. A baker could easily, shortly after bread is baked, call it stale bread, undersell his competitors, and create all kinds of confusion.

Mr. ACKERMAN. Mr. Chairman, we have a similar law to this in Minnesota, and the law defines "stale bread" as any bread that is over 24 hours old. The bread has to be up to weight for 24 hours after baking, and if it is sold after that it is sold as "stale bread" and must be described as "stale bread", otherwise they are guilty of short weight if the loaf is short.

Mr. TINKEY. That is similar to the Ohio provision.

Mr. LEVITT. I think that is a very good law. Our bakers got to the point where they baked any size loaf—I was in one grocery store where they had loaves of bread of 13 different weights. Therefore, I move the adoption of this amendment.

Mr. FISHER. I second the motion.

Mr. FRANK G. SMITH. Most bread now delivered in Connecticut is delivered from New York, and all that bread comes wrapped in packages delivered from the largest bakers. There is none of that bread kept on the shelf for 24 hours, because the driver picks up the next day, the bread that is not sold. There is no chance of it becoming stale. The only time they ask for stale bread is around the holidays, when they want it for stuffing turkeys, etc. At any other time there is no such thing as stale bread.

All those standard bakers in New York wrap their bread and it is sold and marked in ounces. I have never found, in all my inspections, any bread delivered by the large concerns, all of which comes wrapped, and some of it in elaborate wrappers in order to make the sale better, to be of short weight, except that by mistake one time I found an 8-ounce loaf wrapped with a 16-ounce wrapper.

Digitized by Google

I picked them all up and prosecuted the baker, but he claimed that was a mistake made by the wrappers at the factory.

Mr. HOLBROOK. If no bread becomes stale bread and none is sold as such, the provisions of the section do not apply. There is no difficulty there.

Mr. SWEENEY. I should like to ask Mr. Holbrook whether or not he would think it advisable to make a declaration within the present section as to just what stale bread is.

Mr. HOLBROOK. I think it is entirely unnecessary. This section follows the Chicago ordinance, which was upheld by the Supreme Court of the United States in the Schmidinger case (226 U. S. 578). This provides that the provisions of the section in relation to standard weights shall not apply to what is commonly known as stale bread and which is sold as such. In other words, the seller must state to the purchaser at the time of sale that the loaf so sold is stale bread. I think that is the broadest provision as to stale bread that you can very well write, yet the ordinance containing that language was upheld by the Supreme Court of the United States. I would hesitate to depart from it.

Mr. BAUCOM. In here the commissioners are given power to make tolerances. Why can't we establish tolerances in the section, based on the experiences of the commissioners? There are men here who have been in this work for some time. They know what is reasonable. I would like to see the tolerances put right in the law itself. Or, set up the tolerances on bread in another place; I think we ought to set them up right here.

Aside from that, I doubt whether we can enforce that bread law. I don't think we can make it unlawful for a man to put up a package and sell it, when the Food and Drugs Act says that any food in package form may be sold if it has its weight marked on it. I tried enforcing it, and the bakers said, "We will take out an injunction and make you let us sell it." They don't know where to stand themselves. They want a standard loaf, yet with a change in the price of wheat, and competition, they have to change the size of their loaf.

Mr. HOLBROOK. The United States Supreme Court, in 1924, in the case of the Nebraska Bread Act, said it was perfectly competent for the State of Nebraska to fix standard-weight loaves and provide that bread shall be sold only in such loaves.

Mr. BAUCOM. What about interstate commerce?

Mr. HOLBROOK. Only a very, very small fraction of the total amount of bread sold in the United States, enters into interstate commerce. As a matter of fact, I do not believe that the interstate commerce angle was considered by the court in the Nebraska case.

Mr. BAUCOM. I was just thinking of our friend from Connecticut.

Mr. BUSSEY. There is another point in this law that I want to bring to the attention of the Conference. We have a standard-weight bread law in Texas similar in wording to that which we have here, which refers to the loaf of bread and deals with the loaf throughout the law. For the past few months it seems that we have about ceased to have any loaves of bread in Texas. They have all begun to put out a product that they call "sliced rolls." Instead of baking a loaf of bread they put four, five, or six pieces of dough

Digitized by Google

in a regular bread pan, bake it, wrap it sliced, and mark it "sliced rolls." There are several cases pending in court at the present time on that, and I don't know how we are coming out. In city ordinances recently passed in Texas, we have refrained from referring to a "loaf" of bread; we are referring to "bread", making it take in any kind of bread, rolls, or what not.

Mr. DAVIS. Inasmuch as we in the northern part of Vermont lie along the Canadian border, Canadian bakers are sending over their product into our State, and all we can demand is that they mark the weight on their loaves of bread. It must be wrapped, according to our law in Vermont. We had a condition there that gave us a lot of concern because they insisted on sending it over without any marking on it at all. I don't know whether that law would take care of this or not.

Mr. HOLBROOK. Do you have a standard-weight bread law in Vermont?

Mr. DAVIS. No, sir.

Mr. HOLBROOK. Then all you could reasonably require of any baker, inside or outside the country, would be that he mark the weight on the bread. If a baker from Canada sends bread into Vermont, the weight of which is not marked, you could certainly prevent the sale of such bread at retail in the State.

Mr. MCBRIDE. We have a standard-weight bread law in Massachusetts which follows very closely the language here, with some exceptions. We have the power that is proposed in this law to set up tolerances, and we have never been challenged. I don't expect that we will be, since Mr. Holbrook has said that the essence of this law has been passed on by the Supreme Court.

(The question was taken, and the motion was agreed to.)

GENERAL CONSIDERATION OF SUBJECTS OF INTEREST AND QUESTIONS BROUGHT UP FOR DISCUSSION BY OFFICIALS—Continued

The CHAIRMAN. Gentlemen, it is in order to continue the general consideration of subjects of interest, and questions brought up for discussion by officials of the Conference, continuing the discussion of this morning. Are there any matters to be brought up by members of the Conference?

Mr. MCBRIDE. We have a peculiar problem in Massachusetts in relation to fuel oil. Massachusetts consumes a very large quantity of fuel oil, and the method of measuring it has apparently come up for considerable consideration. That commodity is different from most of those we deal with, in that in most cases the commodities are physically present and visible to the eye as you apply them to a scale. The only visible feature of a fuel-oil delivery is the measuring element.

There has been developed there a manifold piping which is located at the rear of the delivery truck, and the compartment lines feed into that manifold. Our difficulty has been this: In the first instance, where the feeding line valve is the only one opened, no difficulty has been experienced in determining accurate measurement. It is entirely possible, however, for an operator to start drawing from one compartment and to exhaust that compartment; then go to another and fail to close the compartment from

Digitized by Google

which he has drawn. In that case you have a possibility of air entry into the liquid line, and that, of course, is very much aided by the efficiency of the pumping unit which is drawing the liquid through.

In addition to that a situation may develop wherein the operator will not fully open the valve from the compartment supplying the liquid. In that case we have found that the worst errors develop. We feel that that situation is one that may easily arise—whether by design or neglect—but in Massachusetts it has been said that we are testing with undue severity when we employ that method. That is particularly in reference to the situation where the operator doesn't fully open the compartment valve line from which he is drawing the liquid. However, we have required that the devices shall be so equipped as to meet a test of that character. I wonder what experience any of the other men have had along that line, and I wonder whether you think that is a test of undue severity.

Mr. ENGELHARD. I believe a section we discussed last year requires that where pipes from the various compartments lead to a common manifold, effective means shall be employed so that liquid cannot flow back into empty compartments. That sounds fine, but in the State of New Jersey there is only one truck in every one hundred which is so equipped. Ninety-nine percent of the trucks would be taken off the road if that were enforced. I believe a sufficient time should be given for the manufacturer or owner of a truck to equip his truck so that there would be a check valve which would permit the liquid to flow out of a compartment but never from the manifold into a compartment. I believe that that is already taken care of in the model specifications that we drew up last year.

Mr. BAUCOM. I rise to a point of inquiry and instruction. Last year, by an act of the Twenty-fifth Conference, a committee was appointed to draw up a draft for a constitution and bylaws. This committee had a basis upon which to start our deliberations upon arriving here. A sort of tentative draft was sent each member of the committee. Upon the convening of the committee it developed that we were not in accord; our minds were not in tune as to just what the duties of the committee were, what were our obligations, and what we were supposed to do. One part of the committee seems to think that we have the power to decide whether or not we need a constitution and bylaws, and that we have power to bring back a report in this form. The other faction complains that we have no authority to do other than what was commanded in the motion which provided for and set up this committee. Therefore, with your permission, I would like to read the minutes of the Twenty-fifth Conference and the motion which was made, and ask that you instruct us so that we can proceed according to the mandates of the motion or according to the will of the Conference.

On the last day of the Conference the Resolutions Committee brought in a resolution which was voted down by one vote, which set up certain procedure for deliberations. Then a member got up and addressed the chair and said, "I think we have a way of meeting the situation so presented by the Committee on Resolutions, and which has value. I make the motion that the Chairman or the President of the Conference appoint a committee of not less than three members of the Conference to draw up a constitution and set

Digitized by Google

up bylaws for the guidance of this organization." The motion was seconded, the question was taken, and the motion was agreed to.

Now then, as I say, our committee finds itself somewhat at a deadlock as to what procedure to take. We want to bring a report to the Conference, and the question is, Can we bring back anything other than a constitution and bylaws, as this commands?

Mr. O'KEEFE. I am a member of that committee and we did discuss the question very thoroughly the other evening, for perhaps 3 or 4 hours, and I was one of those who dissented. I don't think this body needs any constitution and bylaws. Of course, being appointed on a committee, perhaps it might have been our duty to bring in some sort of bylaws, but I don't know how this body . . .

Mr. GRIFFITH (interposing). I rise to a point of order, please.

The CHAIRMAN. Will the gentleman please state his point of order?

Mr. GRIFFITH. We are not discussing a need of the organization. That has already been settled. Definite instructions were included in that motion, which was legally passed by this body last year, and it is the will and order of this body. The clear question here is whether we shall do what it says there.

The CHAIRMAN. I think, gentlemen, that this whole question is out of order at this time. A committee has been appointed for this purpose. The committee will bring its report before the Conference. Specific provision is made for it tomorrow morning. The Conference as yet has no knowledge of what that report is going to be. If you do not approve of the report, it is the privilege of the Conference to so indicate, and to give its instructions accordingly. With your indulgence the Chair makes this ruling and defers this whole matter until the report comes up in the proper order of business tomorrow morning.

Mr. ISING. I would like a little information regarding the delivery of coke in wet weather. It naturally accumulates a lot of water. Is there any tolerance allowed for that?

Mr. MCBRIDE. In Massachusetts our law says that coke may be sold by weight or measure. That isn't the answer, but the difficulty is there present, and I think that it may be said that coke can absorb as much as 80 percent of its own weight. The only way that we handle it there is, where excess moisture may be present in coke, to say that the coke should be sold in the other alternative way, by measure. I think it is without possibility of answer unless a defined moisture content could be drawn on coke. That is our way, but it isn't a complete way.

(At this point, Mr. McBride assumed the chair.)

Mr. GRIFFITH. We have a specification for liquid-measuring devices providing that the indicating medium shall be visible within a field of 120 degrees. There is some confusion in the minds of some of us as to how to definitely define that field in relation to the indicating face of the dial or plate. The question is whether you take the center of the dial or the figure to get the 120-degree angle.

The ACTING CHAIRMAN. I think that is defined, but I think we can save time in answering it. Mr. Holbrook spent some time last year illustrating that, and if Mr. Holbrook will favor us I think he can clear it up.

Digitized by Google

Mr. HOLBROOK. The specification in question provides that in the case of a retail device this field shall be defined by two vertical planes each at an angle of 30 degrees with the counter, graduated scale or dial, or the reading face, and passing through the center thereof. I take it that that means that if you erect a perpendicular to your dial and draw lines making an angle of 60 degrees on each side, these lines will lie in the vertical planes mentioned. (Drawing on blackboard.) This is the plane of the dial as seen from above. This is a line erected perpendicular to this plane. Through the center of the dial, you draw a line here and here, with 60 degrees in here and 60 degrees in there. There are now two equal angles making a total angle of 120 degrees. That determines your field. If the purchaser places himself at any point inside that field, he shall be able to read the registration of the meter.

Mr. GRIFFITH. That is my interpretation of it, too. I just wanted it confirmed.

Mr. FISHER. I would like to ask you what experience you have had with the small meter that is placed in the cellar of the house of the customer who buys fuel oil and that is connected between the storage tank and the furnace. Have you approved that in your State, or have any of the other States?

The ACTING CHAIRMAN. Massachusetts has approved that so-called household meter, but it is not in use in the State.

Mr. FISHER. What means do you use to test that meter annually?

The ACTING CHAIRMAN. None, because it isn't in use.

Mr. FISHER. It is expected to be in use.

The ACTING CHAIRMAN. Under our law testing and sealing shall be annual. The thought that we had on the matter was that a bench test could be made of a number of meters and the meters properly identified and sealed; they could be located in the cellars of the householders but they would have to be removed from the cellars once a year for subsequent bench tests. That doesn't appear to be particularly difficult, because of the construction of the meter. It is a gravity fill from a more or less constant liquid head. The supplying company will have to see that provision is made for sealing facilities.

Mr. WHITE. Recently a grease-dispensing device was submitted to me for approval, and it was my understanding that it had been approved in some of the other States. This device is so constructed that it takes a 1-pound can of rear end or transmission grease in a holder; there is a plunger, operated by air pressure, that comes up from below, cuts the bottom of the can out, and forces the grease through a spout into the transmission or differential.

The point I want to raise is visibility. There is no indicator on the device to show when the can is empty. I believe that there are present at this Conference State men who have seen that device, and who perhaps have passed on it. I would like to have their opinion on an indicating element being placed on the device.

Mr. GRIFFITH. Does that device become inoperative when the can is empty?

Mr. WHITE. It is possible to stop this plunger any time during its travel up the can by releasing the air vent. The customer can not see whether it has traveled the entire distance or not.

Digitized by Google

The ACTING CHAIRMAN. Is that for the purpose of ejecting grease from a container which the customer has purchased?

Mr. TINKEY. We had something similar to that and after we inspected it we determined it was a nonmeasuring device, an ejector. It doesn't come within our jurisdiction.

The ACTING CHAIRMAN. That is the view we took of it, that it is an ejecting device, the same as the dispensers.

Mr. WHITE. That is perfectly true, but there is a great chance to perpetrate a fraud.

The ACTING CHAIRMAN. We wouldn't consider that that was a means of measuring a pound of grease. When determinations are made of quantity a price is paid by reason of a quantity delivered. There must be a measuring element, and this is not regarded as a measuring element.

Mr. WHITE. That is true, but I think it should be considered by our weights and measures officials.

Mr. ISING. What tolerances are allowed on coal deliveries, in the different States?

The ACTING CHAIRMAN. I don't think that is a matter of law; it is a question of judgment. I don't know of any such tolerances.

Mr. BAUCOM. We have set a tolerance of 20 pounds on the load.

The ACTING CHAIRMAN. How did you establish that?

Mr. BAUCOM. That is 1 percent on 1 ton. We claim that any man who can't weigh a load within 20 pounds ought not to be allowed to weigh. We set that up; it is not a law. We believe that that is ample for any little mistake that might be made by a man who is weighing coal. We usually catch our man the minute he hits the sidewalk and probably hasn't driven his truck over 30 or 40 feet; if it doesn't come within 20 pounds of what he puts on the ticket we take him to the court house.

Mr. SWEENEY. I might say for the enlightenment of the Conference that in Massachusetts we have a statutory definition of weight as applied to food and fuel. They must be sold by net weight; there are no tolerances permitted.

The ACTING CHAIRMAN. While Mr. Sweeney has told you we have a law which says that no tolerance is permissible on food or fuel, don't take it that we say that coal must be absolutely as represented on the ticket. Good judgment prevails.

Mr. O'KEEFE. In a great many smaller towns they have only one or two truck scales on which to weigh a load. In Chicago we have hundreds of them and we have to give them a little leeway somewhere. There is a variation in scales. We allow 1 percent.

Mr. ISING. That is what we are doing. I didn't know whether that was right.

Mr. WHITE. Last year in the specifications, tolerances, and regulations for vehicle tanks we passed the folowing: "For vehicle tanks equipped with meters the tolerances to be allowed in excess or deficiency shall be the same as those specified for liquid measuring devices of the wholesale type; that is, 1 cubic inch per indicated gallon of delivery, with a minimum tolerance of 50 cubic inches."

Since reading that over after it passed last year, it seemed to me that the word "minimum" should have been "maximum." I wrote to Mr. Holbrook on that and he came back and said it should be

Digitized by Google

"minimum", as printed. I may have the wrong understanding of that, but it seems to me that the meter would have to be set off 50 cubic inches, and that doesn't seem reasonable.

Mr. HOLBROOK. That is not a required error; it is an allowable error. It would be desirable if the meter were to have a zero error, but it is allowed an error of 50 cubic inches. Consequently that is not a maximum tolerance; it is a minimum tolerance. Plus or minus 50 cubic inches is the smallest tolerance which can be applied against the meter. If the smallest delivery falls anywhere within that range, the meter is deemed to be a correct device. When you make a very large test draft your tolerance must be greater than 50 cubic inches.

The minimum tolerance of 50 cubic inches ties up with the recommended smallest test draft of 50 gallons. If you have a test draft of 50 gallons with a tolerance of 1 cubic inch per gallon, then you have a minimum tolerance, as of course, of 50 cubic inches.

Mr. ENGELHARD. I agree that the word should be "maximum" and not "minimum." If it is plus or minus nothing, that is minimum. If it is fifty, then it is maximum.

Mr. HOLBROOK. If you drew 1,000 gallons of gasoline through a meter would you expect to allow an error of no greater than 50 cubic inches? If you have a maximum tolerance of 50 cubic inches, as I see it, you wouldn't allow more than 50 cubic inches, regardless of the size of your draft.

We use this principle of minimum tolerance frequently. Suppose we consult a table of tolerances to be allowed on platform scales. We find that the tolerances start at half an ounce and go up by ounces into pounds, eventually becoming 200 pounds. We provide, however, that there shall be a minimum tolerance of one of the minimum beam graduations, because if you have a scale which has a minimum beam graduation of 5 pounds, for instance, it is perfectly ridiculous to try to enforce a tolerance of half an ounce against it—half an ounce could not be detected. Similarly, we have a minimum tolerance which is to be applied against any device.

Now, on the wholesale meter the minimum test draft is supposed to be 50 gallons. General tolerances for meters provide that there shall be allowed an error of 1 cubic inch per gallon. If you draw a minimum of 50 gallons at a tolerance of 1 cubic inch per gallon you have inevitably a minimum tolerance of 50 cubic inches. That is not a maximum tolerance, because if you draw 1,000 gallons the allowable error is very much more than 50 cubic inches. The actual error, however, might be zero.

Mr. LEVITT. Under that ruling the tolerance is 1 cubic inch per gallon, with a minimum tolerance of 50 cubic inches. If I went out to test a meter and drew only 20 gallons out, and it was 25 cubic inches short, I could not hold the meter because the minimum tolerance is 50 cubic inches. I have to draw 50 gallons. That is done to keep them from trying to make a test of a meter with 5 or 10 gallons. It is to compel you to draw 50 gallons in order to make the test.

Mr. BAUCOM. To clear it up, just say that your tolerance is 0.2 percent and that will cover the whole works.

Mr. HOLBROOK. Then suppose you took a test draft of 5 gallons from a wholesale meter. Your tolerance certainly must be more than 0.2 percent of 5 gallons.

Digitized by Google

Mr. BAUCOM. I don't mean small meters, getting down to that point.

Mr. HOLBROOK. Suppose you had a flat tolerance of 0.2 percent on a bulk-type meter and attempted to make a test with 5 gallons. Your tolerance should not be 0.2 percent of 5 gallons, because your test draft is too small. Your tolerance should be 50 cubic inches as a minimum to be enforced against a wholesale meter.

Mr. MCBRIDE. Are there any further remarks under that heading, gentlemen? Is that clarified, Mr. White?

Mr. WHITE. I am not operating under that.

CHICAGO ORDINANCE IN RELATION TO VEHICLE-TANK METERS AND THE ENFORCEMENT THEREOF

By JAMES O'KEEFE, *Inspector of Weights and Measures, City of Chicago, Ill.*

In 1935 Chicago passed an ordinance which requires that any petroleum product to be used for fuel, must be measured at the place of delivery, by standard 5-gallon measure, or by a meter which has been approved by the department of weights and measures.

This ordinance reads as follows:

> Measurement of Fuel Oil.—It shall be unlawful for any person, firm, or corporation to sell, offer for sale, deliver or attempt to deliver, any petroleum product or other liquid to be used for fuel, by tank, truck, trailer, or other wheeled conveyance, unless measured at the place of delivery by standard liquid gallon or 5-gallon measure, or by a meter which has been tested, approved, and sealed by the inspector of weights and measures.
>
> Any person, firm, or corporation, including any weighmaster or deputy weighmaster, that shall violate any of the provisions of this article, shall, when no other specific penalty is herein provided, be fined not less than $5 nor more than $200 for each offense. The inspector of weights and measures shall enforce the provisions of this article.

We believe that this is the first law of this nature operating in any community, the practical effect of which is to require that fuel-oil deliveries must be measured at the place of delivery by means of a meter. The delivery man has the option of using a 5-gallon standard test bucket, but since the time element would be great, the companies delivering have practically all equipped their tank trucks with meters.

The petroleum industry has increased its volume of business at a phenomenal rate during the past 10 years. In 1935 it is reported that over 17,000,000,000 gallons of gasoline were sold in the United States, an increase of 1,000,000,000 gallons over the preceding year, and there were millions of gallons of oil sold for fuel consumption.

An industry marketing such a large volume of its products by measure should require considerable attention from weights and measures officials, and the previous prevailing practice of allowing the use of a crude measuring device called a "gage stick" was entirely out of relation to accurate measuring practices covering the sale of other commodities.

Weights and measures officials contended that meters were not accurate, but our department found on testing meters of many different makes, an accuracy of measurement which confined the errors to very small amounts. For instance, while the specifications adopted by this Conference allow 1 cubic inch per gallon tolerance, and specify a minimum testing draft of a tank meter of 50 gallons,

Digitized by Google

allowing a 50 cubic inch tolerance, our experience indicates that this tolerance could be practically reduced to approximately one-tenth of that amount, since 245 meters which were tested varied only 1 cubic inch for each 50 gallons.

Before the ordinance was passed, a committee of the city council held an open hearing at which representatives of the petroleum companies argued for and against the ordinance but we find that since the ordinance has been operating, practically all the companies are in favor of it.

Since the average cost of equipping each tank truck with a meter is approximately $350, and the company must change drainage pipes so that all of the oil must pass through the meter, it was necessary to be very tolerant in giving to the truck owners time to complete the installation of equipment. After the ordinance was passed, all companies were notified that they must be equipped within 3 months, but several extensions were given where a reasonable excuse was made for failure to equip. After another 3 months, inspectors were instructed to halt each tank truck and ascertain whether or not the meter was being used and whether it had been properly tested and sealed. If not, the inspector issued a ticket to the company for a violation. This action brought the few remaining dilatory companies into line and we feel that 99 percent of the trucks delivering fuel oil are now equipped with meters.

We tested 263 meters on the same number of fuel-oil trucks. These tests are to be made twice a year and the fee charged for each test is $1, or an annual fee of $2.

We find that meters are being used to measure gasoline at the time of delivery, although it was not our original intention to force the metering of gasoline to service stations. We believe that it will be only a matter of a few years until all gasoline will be sold through meters, since the fuel-oil truck is usually used in the summer to deliver gasoline and it is quite natural that the company should make use of the meter which is already installed.

The next step must be the education of the purchaser to see that the meter is on zero before delivery is made, to see that the hose is full to the nozzle, and to see the final reading by the meter when delivery is completed. We have secured the assistance of the newspapers in carrying on a campaign of education for this purpose.

In order to test the accuracy of the meters, the department secured space in one of the city-owned garages, where a steel balcony 12 feet above the floor was erected, containing a 100-gallon calibrated tank and a 50-gallon calibrated tank. The tank truck is driven into this garage and the meter is set to deliver 100 gallons. This is pumped into the 100-gallon tank—which has an over-and-under glass gage in the neck—and the amount over and under 100 gallons is recorded. A 4-inch outlet allows the fuel oil to drain back into the compartment from which it was taken. A 50-gallon draft is next pumped from the tank; than a 100-gallon and a 50-gallon draft are pumped without having the meter set to stop at any predetermined amount.

The meter is then sealed with a lead wire seal. The company is required to notify our department before breaking the seal and once this is done, the meter must again be tested and sealed before being used.

Digitized by Google

We have received a great deal of commendation for this ordinance and the fuel-oil consumers of Chicago have been very generous in their praise.

AIR ELIMINATION FOR VEHICLE-TANK METERS

By C. D. Baucom, *Superintendent of Weights and Measures, State of North Carolina*

Ladies and gentlemen, the subject of my address, as you will readily recognize, is technical; therefore, I shall first refresh your memory on certain fundamental physical facts which you learned while in school.

First, a body immersed in liquid is buoyed up by a force equal to the weight of the liquid displaced; second, a body in motion will continue in a straight line unless acted upon by some external force; third, when a body of liquid which is not homogeneous, is in motion and is forced to change its direction, the heavier or more dense portions, which have a greater resistance to such change of direction, will take the outside path around any curve, arc, or angle, and the lighter portions will take the inside path; and fourth, the cohesion between the molecules of a fluid is an important factor (but not the only one) in determining the rate at which a foreign particle will rise or fall through the fluid.

Now then, in discussing air in petroleum products, we must bear in mind these major facts and apply them to the problem confronting us. Under the first item, because of the difference in density air will tend to rise through gasoline at a rate of about 1 foot per second. Any currents in the gasoline stream will have a tendency to reduce this rate. However, if the air bubbles are very much reduced in size this buoyancy force (due to difference in density) on a single bubble will be less than the force of cohesion between the gasoline molecules, and the escape of the air from the gasoline is thus prevented.

As stated in the beginning, a body in motion will continue in a straight line unless some external force is exerted upon it. Manufacturers have endeavored to build a device which will eliminate air that has been caught in the delivery line by collecting it in a dome or chamber and discharging it from there. Baffle plates, grids, and screens have been used in the belief that they will be of vital help, but let us see if they really do help.

When this liquid strikes a baffle plate, its course is changed. As soon as the course is changed, we then run into basic principle three. The heavier portions of the liquid follow the perimeter of the containing chamber and the air is forced toward the center. As an illustration, take an air eliminator built something like the air chamber on a water pump. The liquid enters from the side at the bottom, strikes the baffle plate and then rises to the top of the dome or chamber. Here its course is changed and it starts down with a whirling motion, thereby creating a vortex just above the baffle plate. When the liquid reaches bottom, its course is changed again and it leaves the chamber with the air in the same position as it was upon entering, assuming, of course, that it went through the eliminator at the same rate of flow as before entering. Sometimes screens are put in the line for the purpose of straining out particles which

Digitized by Google

would affect the eliminator or the meter and with no other purpose in mind, yet if these strainers are of exceptionally fine mesh, they will so completely break up the bubbles of air as to practically atomize them. The power of the air bubbles to rise or to overcome the cohesion between the molecules of the liquid itself is reduced, and they will, in their relative positions, pass through both the eliminator and the meter without any visibility whatsoever, but they will cause an overregistering of the meter.

That is a point that probably some of you have not experienced, but I ran into one situation where a manufacturer was putting a 400-mesh strainer in the line, and it was actually demonstrated that a volume of 12.5 percent of air would pass through, yet you wouldn't see it in the visigauge. This resulted, as I just stated, from breaking it up into such extremely small bubbles, that they were not able to overcome the cohesion of the gasoline molecules. Later on, when it was in a glass bowl, you could see the bubbles rising something like bubbles in champagne.

Now then, having applied these basic principles to the problem of air elimination for petroleum products, the question arises, can air be successfully eliminated from petroleum products being delivered in tank wagons? If so, how? Practically all of the bulk-hauling gasoline-tank trucks use a 2-inch discharge. A 2-inch discharge pipe carries 0.1623 gallons per foot, or 6.121 feet of 2-inch pipe will hold 1 gallon of liquid. The pumps used on these tanks are designed to pump about 200 gallons per minute. Thus, a molecule of air in a stream of liquid being discharged through a 2-inch pipe at the rate of 200 gallons per minute travels 1,224.2 feet per minute, or 204 feet per second. Under natural atmospheric pressure air rises in gasoline at about the rate of 1 foot per second. From these figures you will readily see that in a 2-inch pipe a bubble of air while rising from the bottom to the top will travel 34 feet ($204 \times 1/6$). When it goes through an eliminator it may not have time to rise to the top. So it may not be eliminated unless it happens to be at or near the top of the liquid when it enters an eliminator.

From these facts we are forced to conclude that in order to eliminate air with an eliminator that is not excessively long, the velocity of the liquid must be greatly reduced and the eliminator chamber must be of such dimensions that a bubble or molecule of air will not be swept beyond the confines of an air receiving chamber before having time to arise to the top of the liquid.

A study of these conditions will reveal that the controlling element is time necessary for elimination (excluding factors, which will follow), and necessary time is controlled by width and length of receiving chamber.

I have given this considerable study in the past few months and have drawn the following conclusions, satisfactory to me, and which I believe will furnish the only solution. I derived the formula $W \times L \times D \div D/12 = Q$, where W represents the width of chamber, L the length, D the depth of liquid in chamber, D/12 a constant which indicates time in seconds for a bubble of air to rise D inches through the liquid, on the basis that it rises 12 inches per second, and Q, quantity of liquid flowing in cubic inches per second. This formula may be written $W \times L \times D \times 12/D = Q$, and further simplified to the

Digitized by Google

form, $W \times L \times 12 = Q$. Using this formula, we conclude that the air eliminator to take care of 200 gallons per minute, if 12 inches long should be 5.35 inches wide. I might add right here, however, that I have not had sufficient opportunity to test this formula under varying conditions and, therefore, do not suggest that it is infallible.

I mentioned excluding certain factors which would follow. If the liquid be in a whirling motion, it is almost impossible to extract the air from the liquid. Referring to the fact quoted regarding bodies in motion, the heavy molecules are thrown to the extreme outside of the circle which is being described, thus forcing the lighter molecules to the center. As an illustration, I will mention slinging a bucket of water over your head. Some eliminator manufacturers have attempted to prove that if the liquid were thrown over a baffle plate, or otherwise caused to take up a whirling motion, the air would be forced out, which is in fact just the reverse of what actually does happen. If their theory were true, slinging the bucket of water over your head would empty the water from the bucket and cause it to fill with air. Another factor is that liquid in motion has a tendency to hold molecular structure more or less in status quo.

Another problem involved in tank-wagon deliveries is that liquid will flow at the rate of 176.4 gallons per minute through a 2-inch pipe and with a 5-foot head excluding resistance of elbows and bends in the line. This rate of flow is reduced to 78.54 gallons per minute with a head of 1 foot. Thus, you will readily see that when a pump is attached to a delivery pipe and a delivery of 200 gallons per minute is obtained, the suction on the gasoline will tend to separate the molecules and we will have what is commonly known as the breaking up of the liquid, that is, vaporization. When the suction of the pump reduces the pressure on the liquid gasoline, some of the gasoline will vaporize and this gasoline vapor may be driven off along with the air by the eliminator. Naturally, the result of this is that the gasoline meter will not register correctly the number of gallons which were in the tank; in other words, the meter will register a shortage. If, however, on the other hand, the eliminator did not work, the gasoline would be put through the meter in an expanded or vaporized condition and you would get an overregistration. As I see it, the solution of this problem would be the requirement that all pipe lines connecting to a manifold or to the pump must be of such size as to permit a flow of not less than the capacity of the pump when discharging under gravity force.

Another problem which has arisen in connection with tank-wagon deliveries is that practically all of them are connected through a manifold and usually the valves to all compartments are opened before the pump is started. If by accident the valve of one of these compartments is only partially opened the other compartments will be completely emptied before this last compartment, which would result in the admission of an amount of air through the empty compartments far greater than any air eliminator I have as yet seen attached to a tank wagon is able to take care of. You, of course, know that the pump is going to take its suction from the line of least resistance and if the flow from the compartment is throttled, the difference would have to come from the emptied compartments.

Digitized by Google

Now then to sum up in a few words the whole problem of air elimination for tank wagons, we must conclude:

1. That the pipe lines leading from each compartment through the manifold must be of such size as to permit the gravity flow of a number of gallons equal to the capacity of the pump.
2. That an air eliminator must be used of such size and dimensions as to be able to eliminate air from petroleum products traveling through same at the rate of pump capacity.
3. Screens and strainers must not be used having a mesh so fine as to break up and atomize the air bubbles.
4. Some kind of device must be designed which will prevent the complete emptying of the meter and air eliminator and pipe lines to a level below the bottom of the tank itself.
5. Proper vacuum brakes must be provided just past the cut-off valve if and when hose is to be drained.
6. Some mechanical means should be provided which would prevent the partial opening of any valve for discharging.

DISCUSSION OF ABOVE PAPER

Mr. GRIFFITH. It seems to me that the importance of the subject matter of this paper is very great and it should come to the attention of all weights and measures officials, especially in localities where the heating of buildings by the use of fuel oil is rapidly increasing. I believe it would be very desirable to request the National Bureau of Standards to assist us by an investigation of the principles underlying air elimination so that we could adopt, possibly at the next Conference, more comprehensive requirements for air elimination in connection with meters installed on tank trucks.

The ACTING CHAIRMAN. I think it might be a good idea if this Conference were to request the Bureau to conduct some research on the question of air elimination. Do you think there could be objection to that, Mr. Holbrook?

Mr. HOLBROOK. No; there is certainly no objection to it. If such a resolution is passed we will certainly take steps to see what we can do for you. I can not decide off-hand what character of investigation is desired, or necessary, but we could ascertain the problems. If there is any way in which we can be of assistance, we will be very happy to do whatever we can.

The ACTING CHAIRMAN. That might take the form of a suggestion to the Resolutions Committee.

Mr. GRIFFITH. Just as you decide.

The ACTING CHAIRMAN. The Resolutions Committee can bear the suggestion in mind and take appropriate action in relation thereto.

Mr. WHITE. The Resolutions Committee is meeting at seven o'clock, and they will be glad to entertain any suggestions for resolutions from any member of the Conference.

Mr. GRIFFITH. I move you, sir, that the suggestion just made be considered by the Resolutions Committee and a suitable resolution returned.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Digitized by Google

PORTABLE TESTING EQUIPMENTS FOR LARGE-CAPACITY METERS AND VEHICLE-TANK COMPARTMENTS

PAPER PRESENTED BY WALTER G. WHITE, COMMISSIONER OF WEIGHTS AND MEASURES, STATE OF NEW HAMPSHIRE

It is probable that a large percentage of weights and measures officials are faced with two problems instead of one when they are considering the adoption of new and sometimes untried testing equipment. There is, of course, the problem of securing equipment that will accomplish the task, and this is difficult when pioneering in a heretofore almost unexplored field. The second problem I refer to is one of finances. I speak of this because it bothered me as much as the selection of proper equipment. Why, I do not know, but it seems to be the opinion of many that weights and measures work can be carried on with little or no cost. Unless your department is financially able to purchase equipment, similar to that which I am about to describe, it is my opinion that you had better let it alone until it is; for we started out with just the meter, and had all kinds of trouble.

Assuming that necessary funds have been provided, even though they may be limited, you should make a survey of your territory, having in mind the type of equipment to be tested, and under what conditions you will be compelled to work. From this survey you will then determine the nature of your testing equipment. It will be of two general classifications, either portable or stationary. In this discussion I will deal only with the portable. Aside from the actual determination of the accuracy of the device being tested, you will face numerous other factors in the operation of the testing equipment.

In New Hampshire, our survey showed that we would be dealing with gasoline, kerosene, and two grades of fuel oil as testing mediums. We found in some instances gravity flows could be used but at other stations power would be necessary. We also found that not all stations had electric power, or had power but no outlets. We were quite concerned about our source of power for the pump and considered a gasoline-powered generator, a generator to be run from a power take-off from the automobile motor. All of these were considered while the portable testing equipment was in the embryo stage; but finally, due to safety factors, we selected the municipal lighting system as our source of power. With this decided and with the other information gained from our survey we then made a rough sketch of the proposed testing equipment and submitted it to a manufactory where meters, pumps, etc., are made for the petroleum industry.

The testing equipment consists of the following: One 100-gallon test measure mounted on three legs that are adjustable, having a 4½ inch dome with a glass gage calibrated 50 points plus and minus, and a two-way level mounted on its top; one explosion-proof ⅓-hp electric motor, wired so that either 110 or 220 volts may be used; one vapor-proof switch; one pump with by-pass, capacity 20 gallons per minute; one air eliminator and strainer; one meter; and one quick-acting gate valve (the gate valve is an added safety factor). The motor, pump, air eliminator and strainer, and meter

Digitized by Google

are all mounted on the test measure so that it becomes one unit and this unit is fastened to skids which, in turn, are bolted to the bottom of the pick-up body in which it is carried. The position of the valves and piping will be explained later when the slides are shown.

If possible, we use a gravity flow through our meter for calibrating vehicle-tank compartments. By gravity flow, I mean that we connect direct to the outlet or delivery line of the bulk storage tank and run the testing medium through our meter and into the compartment under test, without the use of the pump. In many cases the bulk stations have a special connection for us to use, but sometimes the piping is such that we cannot connect without a great deal of trouble; so under this circumstance we draw the testing medium into the 100-gallon test measure and use the pump to complete the test. In some instances, where the bulk station has meters installed in their delivery lines, we first verify the meters with our test measure and then use the line meter to calibrate the vehicle-tank compartments. Where a great amount of work is to be done at one station this method expedites the work with a minimum of interference with the operation of the station. After the vehicle-tank compartments have been calibrated, and while they are still full, we check the vehicle meter if the vehicle is so equipped. In verifying the vehicle meter the testing medium is circulated from the tank compartment through the meter and back into the tank compartment until about 25 gallons have passed through the meter, to avoid all chances of partially filled lines. Then nozzle is closed and placed into the 100-gallon test measure. After meter has been verified we dispose of testing medium in our test measure either by the use of our own pump or that of the vehicle. If vehicle pump is used, connection is made from the drainpipe of the test measure to the manifold or intake line of the vehicle.

Not many of the vehicle tanks in New Hampshire are equipped with gravity flow meters. Where this circumstance is encountered, it is now necessary to place the vehicle tank on a higher level than our test measure. This is not entirely satisfactory and if the use of gravity meters increases, we will be obliged to make special provisions for this work, probably by the use of a light 50-gallon test measure that can be placed on the ground.

I mentioned that gasoline would have to be used as a testing medium under certain conditions. On bulk-station line meters, that is, meters on the delivery lines, it is obvious that the testing medium must be that medium which regularly is dispensed through the meter. It follows then that gasoline must be the testing medium for meters dispensing gasoline. Also, you will occasionally find a bulk station that does not handle anything but gasoline. Here, again, gasoline must be the testing medium for verifying the meters as well as the vehicle-tank compartments. Outside of the hazard involved, gasoline is quite reliable as a testing medium when properly used. Due to the fact that gasoline is usually stored in overhead tanks, its temperature is fairly close to the atmospheric temperature, and as the test is run in a few minutes, little opportunity is given for expansion or contraction. In using it as a testing medium, the dome of the vehicle-tank compartment must be covered to prevent losses through vaporization. Also an extension pipe must be installed on nozzle so that fluid will be delivered to the bottom of compartment

Digitized by Google

tank. However, we never test with gasoline except as the last resort. We never use gasoline as a testing medium from underground storage, due to the difference in temperature, and we never test until after the plant manager has been advised of the dangers and consents to the test.

I have neglected to mention the fact that the testing equipment is so arranged that the meter can be verified with the test measure. Each week during the period the testing equipment is in operation the meter is verified. Such frequent checking probably is not necessary, as we have never found it to be out, but wanting to be on the safe side this policy is still in force.

Finally, portable testing equipment must be as its name implies, portable. Yet, for the sake of portability, accuracy and efficiency must not be sacrificed.

Too many kinds of tests should not be tried with the same equipment.

While specifications adopted last year, by this body, allow a minimum testing draft of 50 gallons, I believe a test draft of 100 gallons is much more satisfactory. We do not follow the minimum tolerance requirement of 50 cubic inches, as approved by this body last year. I may have the wrong understanding of "minimum tolerance", but I can see no reason for allowing a tolerance of 50 cubic inches on 50 gallons. Fifty cubic inches is enough tolerance for a testing draft of 1,000 gallons and even greater amounts.

Our record of tests indicates that the meter method of measuring is very satisfactory. Here I have the inspection report forms that we have developed for this work. It is probable that somebody may be interested in them. I will leave them on the desk. If you care to tear out some for samples you are at liberty to do so.

In the National Bureau of Standards they have facilities for calibrating meters. From what I was able to learn while here last year, the meters they test are used principally for checking brewery meters, and I am informed by Mr. Holbrook that the testing medium is water. This year I wanted to have our meter calibrated by the National Bureau of Standards, but I did not dare to allow the use of water as a testing medium. It seems to me that the use of meters for testing work will increase rapidly. Many States have already adopted this method, and many others are considering their adoption. The accuracy of the meter is of tremendous importance. I believe most State departments will not have the means of carrying out the precision work necessary to determine their accuracy, and so I am suggesting that the National Bureau of Standards consider means of rendering this service to the States.

It is probable that I have not covered many points of interest. It is difficult to know what is interesting to others. The program has allotted time for discussion of the papers given this afternoon. I will be pleased to answer any questions, either during this meeting or afterwards.

(At the conclusion of this paper Mr. White showed a number of lantern slides of the equipment described in the paper.)

Digitized by Google

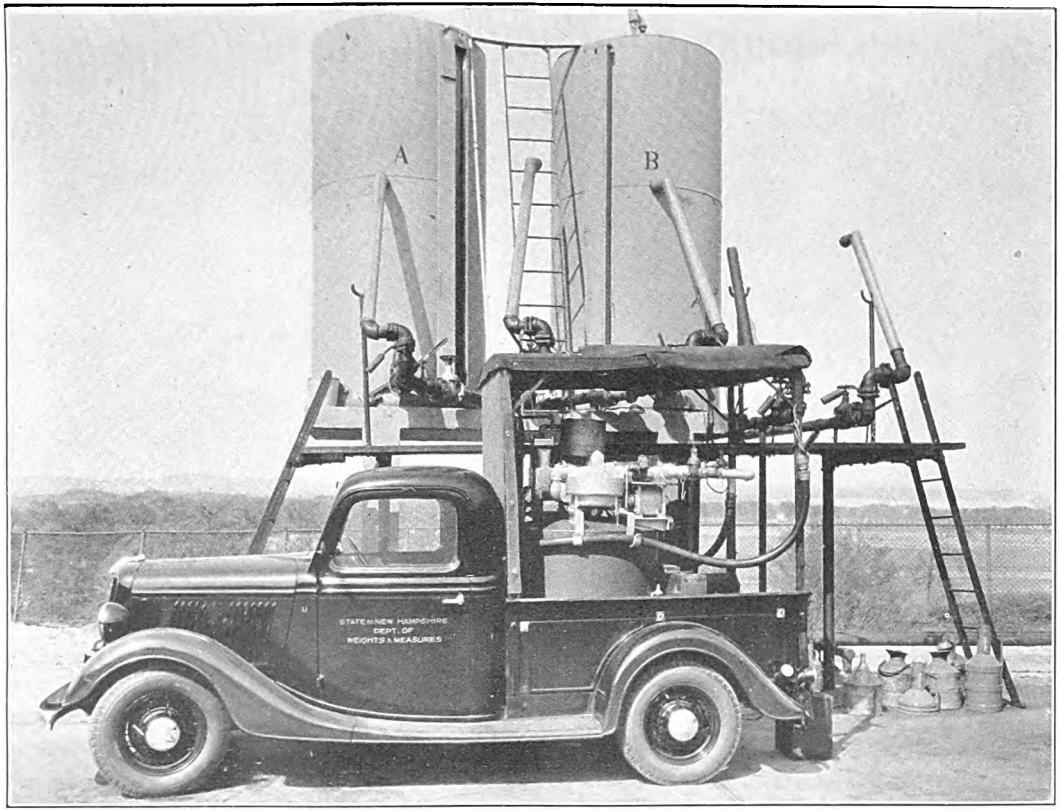


FIGURE 13.—*Portable testing equipment for various liquid-measuring devices, of State of New Hampshire, at a typical bulk storage plant installation.*

Digitized by Google

Digitized by Google

PAPER PRESENTED BY JOHN R. BOOTH, SEALER OF WEIGHTS AND MEASURES, CITY OF HAVERHILL, MASS., AND DELEGATE FROM MASSACHUSETTS SEALERS' ASSOCIATION

In preparing a paper on this subject the thought occurs to me that it might be well to go back a few years into the question of some of the early methods employed in delivering and measuring fuel oil and gasoline, point out some of the errors and possibilities of errors of those methods, and endeavor to show the advantages of the present system. So, with your indulgence, I will go into this phase of the matter.

It will be recalled that deliveries of these commodities first commenced in the conventional 5-gallon bucket can, all of which were sealed. The matter of testing and sealing these cans presented no great difficulty but many sources of error in this form of delivery were manifest, i. e., spillage, dented cans, improper filling of cans, especially neglect to fill can to the designated filling point, and the great length of time consumed by this method. These early cans were wide-necked cans not graduated, and an error of a few cubic inches in reading the liquid level in the neck of the can was easily made. This error, multiplied by the number of times the can might be used in delivery, would make an appreciable difference; for instance, in delivering a 500-gallon compartment 100 drafts would be made. This method also entailed the danger of loss of count, and the variation of temperature over the long period of time during which a delivery was being made presented another source of error.

To overcome this situation entire compartment deliveries were contemplated and the compartments were tested and sealed. This method required all compartments to be sealed with a definite filling point. This point took the form of an adjustable brass or steel tongue on a threaded bolt held in place by check nuts. If the compartment lines were manifolded it was necessary to equip such lines with check valves in order to prevent backflow of oil from one compartment to another. It was also necessary to stencil on the outside of each dome the capacity of that compartment, and to identify each compartment and its proper discharge line. The piping, likewise, had to be considered and, in some instances, it formed a part of the compartment capacity. This method of delivery presented no way of determining quantities of less than compartment capacity except by the so-called gage stick. The stick system has never been regarded as legal in Massachusetts and has many possible sources of error, i. e., not holding the stick perpendicular; tank not being level; creepage of the liquid on stick; and the substitution of a wrong stick for a specific tank.

It soon became apparent that the 5-gallon graduated can was not the proper means of testing a compartment as it can be readily seen that a compartment of capacity of anywhere from 150 to 500 gallons or more necessitated the consumption of a great deal of time and had possibilities of error due to loss of count, temperature variations, and failure to keep a correct check as to the filling point reached in the graduated neck of each can. I might say here that the trend in Massachusetts is now definitely toward measuring tank-wagon deliveries by meterized equipment, so that tests of compartments are becoming less frequent.

95684—37——9

Digitized by Google

The first departure from this 5-gallon graduated measuring-can method, was to accurately test a tank-truck compartment and use this as a testing unit. This method was adopted as a temporary expedient. Manifestly this was an improper procedure because the sealer had no permanent custody of the testing unit as it was the property of the oil company and was used in regular commercial practice; therefore no assurance of accuracy could be had, so that a retest was necessary on each subsequent use of the compartment for test purposes.

To properly meet this situation calibrated tanks of 50- and 100-gallon capacity were developed. The first of this type of tank was transported on the sealer's truck to points of test. The objection to this type of tank was twofold. There was no means of emptying other than through the faucet, on gravity tests, which made it difficult to save the liquid used in test, and this confined the testing liquid to water. In tests involving meters, water, of course, was not a proper liquid. Likewise, in gravity tests, it was necessary to place the test tank on an elevation, fill with liquid, and then empty into compartment under test; thus the method gave a result only on capacity of compartment to contain.

The State division of standards in 1933 developed a 100-gallon portable test tank. This tank was mounted on a trailer which was readily attached to an automobile. The tank was equipped with an electric motor-driven pumping unit, air separator and meter, and with suitable levelling devices. By means of the pumping unit it was possible to pump the liquid from the test tank, which was properly equipped with facilities for draining, and with this tank it was possible to use the same liquid for which the meter or compartment was intended to be used. Also, with the later equipment the test is made in relation to the accuracy of the compartment to deliver. The State division of standards is equipped with two test tanks, one of 100-gallon capacity and one of 50-gallon capacity, and many of the cities and towns now are equipped with a similar type of portable test tank. Before I describe these, however, I want to describe an equipment owned by the city of Springfield.

Springfield has a barrel-shaped 50-gallon-capacity tank which is installed in a sedan delivery truck, which is their regular all-purpose truck. The floor of this truck is covered with sheet metal. The can is welded to angle-iron legs attached to shoes to fit a track on the floor of the car so that the can may slide in and out on this track. When a test is being made the tank slides part way out of the car on these tracks and one end is sustained within the truck, the other end by a jack under the can.

The first tank developed by the division of standards was of 100-gallon capacity and constructed of 8-gage steel. The dimensions of the tank itself are 24 inches wide by 32 inches high by 30 inches long with a graduated neck of 120 cubic inches plus, and 120 cubic inches minus. The top of the chassis carrying the tank is 22 inches from the ground giving over-all height of 54 inches. The over-all length of the tank is 92 inches and the over-all width 64 inches. It is standard tread so that the tank readily trails behind any regular passenger car. This tank is equipped to discharge by either power or gravity, and is also provided with a suction inlet so that liquid

Digitized by Google

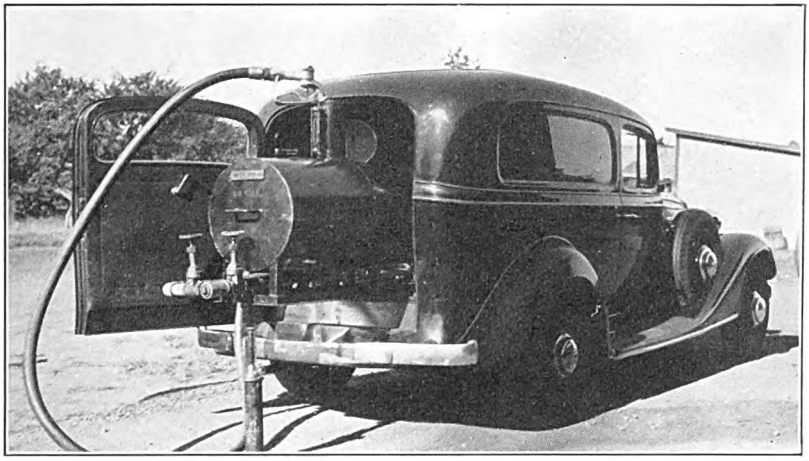


FIGURE 15.—*Testing truck of the city of Springfield, Mass., showing test tank for measurement of large volumes of petroleum products.*

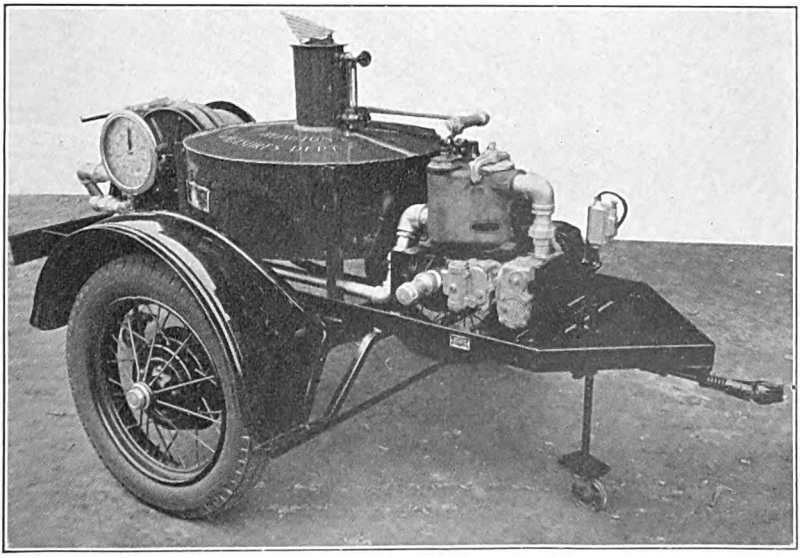


FIGURE 16.—*Portable testing equipment for large-capacity meters and vehicle-tank compartments, of town of Arlington, Mass.*

Digitized by Google

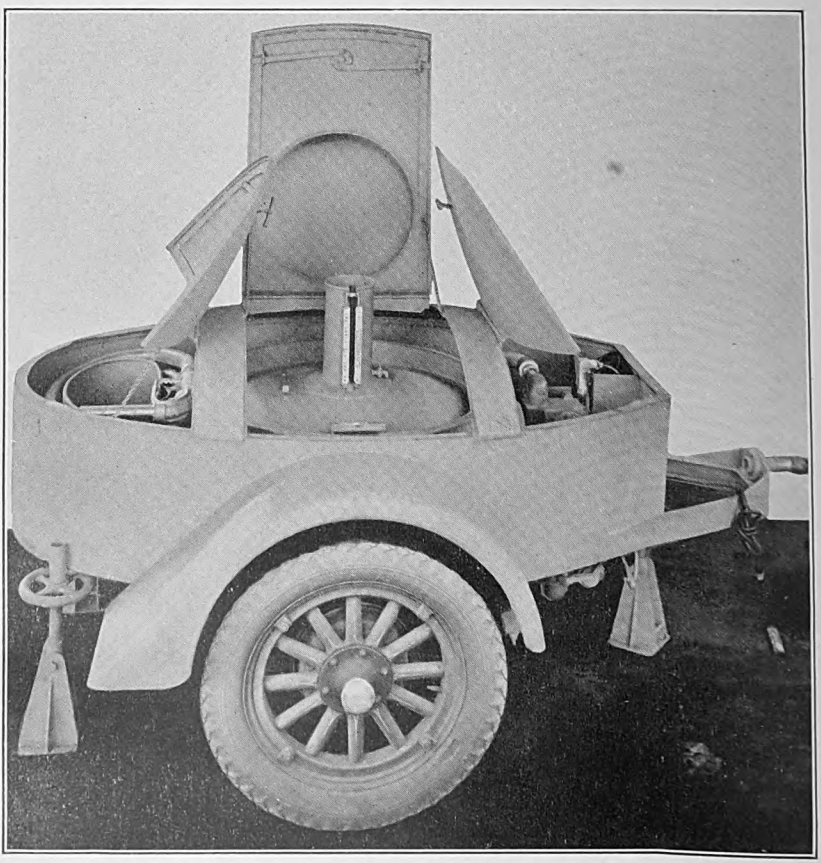


FIGURE 17.—*Another type of portable large-capacity test tank used by State of Massachusetts.*

Digitized by Google

may be pumped from household tanks for the purpose of measuring delivery. The weight of the tank empty is 1,300 pounds. The pump is operated by a ¼-horsepower motor and carries 125 feet of cord so that the same may be readily plugged into any lighting circuit. The device is equipped with two-way level and levelling jacks. It takes but very few minutes to put the tank in readiness for test.

The division of standards also has a 50-gallon cylindrical tank with the same features as in the 100-gallon tank except that this tank weighs 1,215 pounds empty and differs in shape and design and has no meter.

The testing equipments owned by the cities and towns are, as I have said, generally similar to those owned by the State. In some instances the test tanks are equipped with meters and air release units; however the meter is not regarded as a testing unit, the test tank itself being the sole standard. The presence of the meter and air separator on the test tank retards, of course, the speed in emptying the tank. The pumps are operated, generally, by a motor of ⅓ to ¼ horsepower, and develop a speed varying from 10 to 25 gallons per minute, thus making it possible on the 50-gallon test to empty the test can in 2 to 3 minutes, and on the 100-gallon test in 5 or 6 minutes. Generally about 20 to 30 feet of 1¼-inch hose is used, and an extension of about 100 feet of cord will be sufficient to enable the motor to be plugged into a lighting circuit. The motor is 110 to 220 volts. In most cases the equipment is mounted on a trailer and the motor, pump, etc., are protected by metal housing against the weather.

The main advantages of the large test tank, of course, are the reduction of the multiplication of errors, such as errors in the 5-gallon calibrating can and errors due to temperature changes, and the saving of considerable time.

Before any test is actually made an inspection should be made of the tank-truck meter system, observing the system of discharge lines as to whether they are manifolded, the suction line, types of valves, presence of check valves in compartment lines, and the air releases and the vent therefrom as to whether or not the system is equipped with a back-pressure valve and antidrain nozzle. With the portable test tank absolutely level the usual procedure is to make a straight test of the meter with the line valve wide open. Also tests are made at both minimum and maximum speeds for which the meter is rated. Next a test should be made with all empty compartment valves open and the liquid-containing compartment line valve full open, as this is a condition which might normally develop where an operator would start delivery from one compartment and, exhausting the supply of that compartment, would proceed to another compartment without closing the valve of the empty compartment from which he had previously drawn. A test also should be made where manifold lines are involved with the empty compartment line valve nearest the suction line open. Further tests should be made to determine the possibility of manipulating the valves so as to defraud, and these tests should involve cracking the liquid-containing compartment line valve to various openings during the process of delivery, with empty compartment line valves also open. We have found by this process that shortages in varying degrees can be accomplished. In one instance on a

Digitized by Google

100-gallon draft a shortage as high as 11½ gallons was effected. It is contended that this latter form of test is severe, but it is justified because of the fact that it simulates a condition which may readily be accomplished, deliveries from tank trucks in most instances being in the absence of a purchaser. This form of test also shows defects in types of air releases such as inadequacy of means of separating the liquid and air and of quickly eliminating the air. All these tests are possible with the larger tank and readily show results which could not be obtained by using the 5- or 10-gallon can.

Many tests of all makes and sizes of meter systems have been made during the past year, also of all piping sizes and various arrangements, and practically all have shown errors. The tests included range oil, and fuel oils grades 1, 2, and 3. With the heavier oils on a cracked valve test the meters showed a greater tendency of error, but no seal is applied unless the device tests within tolerance. The explanation of the various tests with their resultant errors may sound like a condemnation of the meter system and manifold lines, but they are mentioned here because they are in direct relation to the portable testing equipment which the State and many cities of Massachusetts now have. Those errors have existed for some time but apparently went unnoticed with the testing equipment used heretofore; the larger capacity testing measure is, therefore, proving very satisfactory and, as I have said before, discloses conditions which no one anticipated.

It is plainly evident that, with the enormous growth in the oil industry, and the many methods of delivering being used, considerable thought must be given by weights and measures officials and manufacturers alike in an effort to offset the conditions which I have described.

(During the presentation of this paper Mr. Booth showed a number of lantern slides of the equipments described in the paper.)

(At this point, at 4:45 p. m., the Conference adjourned to meet at 9:30 a. m., Friday, June 12, 1936.)

Digitized by Google

SEVENTH SESSION—MORNING OF FRIDAY, JUNE 12, 1936

(The Conference reassembled at 9:45 a. m., at the Washington Hotel, Mr. John P. McBride, first vice president of the Conference, in the chair.)

REPORT OF THE COMMITTEE ON SPECIFICATIONS AND TOLERANCES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN, AND DISCUSSION THEREON

Mr. Chairman, ladies, and gentlemen, at the Twenty-fifth Conference on Weights and Measures the following resolution was adopted:

Whereas the National Bureau of Standards may find it possible during the coming year to republish Miscellaneous Publication M85, containing all codes of specifications and tolerances of the National Conference on Weights and Measures, for the use of officials; and the codes should thus be in as good form as possible for the convenience of the officials: Therefore be it

Resolved, That the Committee on Specifications and Tolerances be given authority to reword the requirements without changing their meaning and effect, to make any desirable rearrangement and renumbering of paragraphs, and to amend cross references as to applicable codes, in the interest of brevity, good form, avoidance of unnecessary repetition, and satisfactory classification.

SECTION ON SCALES

The codes most susceptible of that character of treatment contemplated by the resolution were the codes for scales. These codes had their inception in 1913 and grew up gradually. Specifications were added and amended, and new headings were added, from time to time, until in the various codes it was necessary, in order to determine the requirements referring to some devices, to resort to a great deal of cross referencing. For example, we may take a computing scale. Under the heading "Computing Scales" there appeared certain requirements. A computing scale is also an automatic-indicating scale in many cases. To determine the specifications applicable to such a computing scale it was then necessary to consult the specifications under the heading "Automatic-Indicating Scales." A computing scale is usually a counter scale, so specifications under this heading had to be consulted in most cases. A computing scale might be of the spring type, in which event it was also incumbent upon the reader to go to the heading "Spring Scales" to determine which of the requirements there given were applicable. Computing scales were also subject to the general specifications for scales, so under this heading were to be found additional requirements. Tolerances for a computing scale of the spring type were contained in one of two tables, while tolerances for a computing scale of the pendulum type were in still another table. To sum up, due to the manner in which the codes grew up, the difficulty involved in finding all the applicable requirements was very great, at least until after considerable experience in dealing with the subject matter.

The committee has attempted in this horrendous document, put in your hands some 48 hours ago, to reclassify and reword the specifica-

Digitized by Google

tions and tolerances for scales in order to simplify their presentation and to make it easier to determine the various requirements applicable in any case. We placed this document in your hands just as early as possible—actually on Wednesday morning—with the idea that you would look it over and study it to determine whether this form and content was satisfactory to you.

The committee is prepared to say that it is its opinion that these specifications, tolerances, and regulations impose upon scales the same requirements that have been imposed formerly, except in certain cases which will be individually called to your attention. In these cases, the committee believes that the meaning of individual specifications has been changed by new language employed, so we desire to call your attention to the changes, and, after you have considered them, we will suggest specific action looking to their adoption. Later two specifications will be recommended for repeal.

One more word may be said: Despite the bulk of this document it is nevertheless very much shorter than our present codes, as can readily be demonstrated when we tell you that in one case, for instance, six specifications scattered through the former codes become only one specification of equivalent length in the code now before you.

The code starts off with some definitions. These definitions have in some cases been assembled from various parts of the old codes and in many cases they are new. However, a definition, of course, is not a requirement, but is simply put in for clarification.

Is it the desire of the Conference that the definitions be read, or are you familiar enough with those to allow us to pass them? They are in many cases new material.

(No request for reading of the definitions was made.)

Mr. HOLBROOK (continuing). Referring to B–2b (3), this specification reads as follows:

Stability of balance condition.—When the beam or indicator of a scale is displaced from a position of equilibrium to the full extent allowed by the construction of the scale, it shall return to this position after release. When a scale is equipped with a locking device or a relieving device or unit weights, repeated operation of the locking or relieving device or repeated application or removal of unit weights shall not materially affect the balance condition of the scale.

The committee is of the opinion that the material with relation to unit weights is new. The other material is already in the specifications.

I suggest that on account of the fact that the amendments are scattered throughout the document in your hands, they be voted upon individually as read.

The ACTING CHAIRMAN. Gentlemen, what is your pleasure on the acceptance of the requirement that the chairman of the committee has just read?

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK. Proposed specification B–2b (4) reads:

Interchange or reversal of parts.—Scale parts which may readily be interchanged or reversed in the course of normal usage shall be so constructed that their interchange or reversal will not materially affect the balance condition or the accuracy of the scale. *Scale parts which are susceptible of inter-*

Digitized by Google

change or reversal in normal field assembly either shall be so constructed that their interchange or reversal will not materially affect the accuracy of the scale or the parts shall be so marked as to indicate proper positions.

That specification presents a considerably broader requirement than originally, and it is to be considered in part as new material. The old specification referred to corner loops only. This refers to all parts that are so constructed that they are susceptible of interchange or reversal in the field assembly of the scale.

The committee proposes the adoption of that specification in its amplified form.

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK. Turn back just a moment. I may say that on the first page, under A–2a (1), in the first paragraph of the definitions it is provided that the fractional bar of the beam is to be included in the sum of the capacities of the remaining reading elements, only when this exceeds 2½ percent of such sum. The figure 2 percent was used in the old specification. Examination of a number of types made at various times has indicated that 2½ percent is a better figure. The change is formal, because obviously 0.5 percent on the capacity is a matter of no moment, but inasmuch as a change is made from the old requirements I present that for consideration. This will bring this requirement into conformity with other recognized specifications on scales.

(The amendment was duly adopted.)

Mr. HOLBROOK. Referring to B–2c:

Balancing means.—A scale shall be provided with a mechanical device or other means by which the balance condition may be adjusted. All loose material used for the balancing of a scale shall be securely enclosed.

The second sentence referred formerly to counter scales only. It is now recommended to be made of general application. The committee certainly believes that loose material used for balancing a scale of any type should be securely enclosed.

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK. Referring to B–2i (4). The last two sentences are new material. They read:

That dimension of the tip of the pawl which is transverse to the longitudinal axis of the beam shall be equal to the corresponding dimension of the beam notches. The tip of the pawl shall be rounded off so that a small amount of foreign matter in the bottom of the notch will not prevent the poise from assuming its correct position.

The requirement of the length of the pawl is to provide for a more secure seat in the beam notches so that it may not be slightly rotated on the beam, causing an error of indication. When the tip of the pawl is rounded off, the pawl will remain longer in good condition than when the edge is sharp and sets upon the bottom of the notch in the beam. The wear on the beam will also be less and the almost inevitable collection of dirt will not prevent the pawl of the poise from seating properly.

We propose that for adoption.

Mr. ALLEN. Is that to be construed as applying to the tip of a hanging poise? On the poise which works in notches there is a knife edge on the poise.

Digitized by Google

Mr. HOLBROOK. No. As you see, the application of this specification B–2i (4) is limited. The hanging poise does not have what is known as a pawl. If you will look two specifications below, in B–2i (6), you will find a specification for hanging poises which requires the bearing edge of a hanging poise to be hard and sharp and to be so formed as to allow the poise to swing freely in the notches.

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK. The next amendment is somewhat more important. A new specification, B–2n, is proposed to read:

B–2n. Damping device.—*An automatic-indicating scale shall be equipped with an effective dash-pot or other equivalent damping means whenever the incorporation of such a device is necessary in order to bring the indicating elements quickly to rest.*

We all know that a commercial scale which continues to vibrate for a long time is rather a dangerous scale to have in use because the merchant will probably either try to read the scale before it has come to rest, or arrest it with his hands in order to obtain the reading. We feel that fraud or mistake is very likely to follow.

Many scales are now equipped with damping devices. We know that many automatic-indicating scales on the market do not need damping devices because they come to rest quickly of themselves. This language is general, but it is as specific as the committee has been able to make it.

We think the specification is one which will be very valuable in practice and will discourage the manufacture of scales which may be fraudulently or inaccurately used due to excessive vibration.

Mr. TINKEY. I would like to have that word "quickly" interpreted. What do you mean by "quickly"?

Mr. HOLBROOK. Well, I am glad I said that this language was general. It necessarily is more or less indefinite. A scale should be equipped with a device which will arrest vibration provided it does not come to rest in such a reasonable time that the merchant is willing to wait for it, provided that it vibrates so long a time that the merchant will be tempted to read it before it has come to rest.

Mr. TINKEY. That is what I have in mind, but I think it is open to argument this way. I am for it, understand, but it is a matter of interpretation.

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK (reading):

B–2o. Unit weights.—*The total value of all unit weights in place at any time shall be automatically indicated on the reading face. The mechanism for applying and removing unit weights shall be positive in its operation and shall provide for the rapid addition and removal of unit weights one at a time; it shall be controlled by means conveniently located and operated in a simple manner from the outside of the housing; it shall function properly irrespective of the speed of manipulation.*

That specification incorporates one or two of the old specifications, but in the opinion of the committee it adds some new requirements; therefore we present it to you for approval in toto.

(The specification as proposed by the committee was duly adopted.)

Digitized by Google

Mr. HOLBROOK. The next item is on page 10, B–2t (2):

Built-in types.—The installation of all built-in scales shall be such as to insure foundations and supports of adequate strength, rigidity, and permanence; *all working parts of the scale shall be in proper condition as to level and vertical alinement;* adequate clearances shall be provided around all moving parts.

That specification is new in part. It has been called to the attention of the committee by a man who has carefully studied this document, that it is just as necessary for a permanently installed self-contained scale to have a permanent foundation as it is that a built-in type have a permanent foundation, and I absolutely agree with that idea. I think that the specification should be amplified, if possible, to make it apply to all scales which are permanently fixed in one position.

Perhaps the language could be made to read in this style:

The installation of all scales which are permanently installed in one location shall be such as to insure foundations and supports of adequate strength, rigidity, and permanence.

One other thing suggested by the same authority is that the word "moving" is not sufficiently inclusive. There are parts of a scale which do not move but which are nevertheless "live" parts. They should have proper clearance around them, inasmuch as the scale will be affected if binding is caused at those places. So, if I may, I will suggest that the word "moving" in the last line of that specification be made to read "live."

Mr. SWEENEY. Mr. Chairman, I move the adoption of B–2t (2) with the changes specified by Mr. Holbrook.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. We will now turn to page 13, D–2c (2):

Width.—*The weight graduations and the value graduations shall be clear and distinct, but in no case shall their width be less than 0.008 inch—except as provided in paragraph D–2c(4)—nor more than the width of the minimum clear interval between the graduations.*

The words "nor more than the width of the minimum clear interval between the graduations" are new. However, that language has applied previously to all weight graduations, and we think that it should apply to value graduations likewise; therefore the committee proposes the specifications as amended for consideration.

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK. I might call attention, on page 16, to specification F–3b. As written here, it reads:

Knife edges and bearings.—All knife edges and bearings shall be made of hardened and tempered steel, or of agate.

It has been suggested by the gentleman to whom I have previously referred, that the word "pivots" would be better than "knife edges" there, and I agree with him. The whole pivot should be of hardened steel.

It has also been suggested that the words "hardened and tempered steel" are old-fashioned language, and that under present-day conditions the material in question should be referred to as "hardened

Digitized by Google

steel." As I understand it, under new processes all hardened steel is not now tempered, nor is it necessary that it be tempered; it can be made hard without tempering. Therefore, I propose that that specification read:

All pivots and bearings shall be made of hardened steel or of agate.

That will make it new material, though it is merely a clarification of the meaning of the old specification.

The ACTING CHAIRMAN. What is your pleasure, gentlemen?

Mr. HARRISON. I move its adoption.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. I may say that in some cases the phrase "hardened and tempered" has been used in other paragraphs; also in some places "knife-edges" may have been used in place of the word "pivots", where "pivots" is the better word. In view of the fact that you have amended this specification as noted, I suggest that the committee be instructed similarly to amend other specifications as necessary to make them uniform in these connections.

Mr. SWEENEY. I move you, sir, that the suggestions of Mr. Holbrook relative to the substitution of the word "hardened" for the words "hardened and tempered" and of the word "pivots" in place of the words "knife-edge" as they appear throughout the specifications be adopted.

Mr. HOLBROOK. May I amend that by saying "in all cases where 'pivot' is meant"? "Knife-edge" will occasionally be meant, and it should be retained.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. Now, please refer to page 22, table II. The members will recall that we have two classes of scales, class A and class B. Class A includes scales of certain types when installed indoors; class B includes these types when they are installed outdoors. The class B tolerance is twice the class A tolerance, and these types when installed outdoors are placed in class B on account of the increased difficulty of maintaining the accuracy of a scale in an out-of-doors location. However, one or more manufacturers have contended that in so far as they are concerned in their manufacturing operations there is no distinction between a dormant or a built-in scale of class A and of class B, because when they are building the scale they very often have no knowledge as to whether it is going to be installed indoors or out. They therefore suggest that all scales of the types mentioned are adjusted to the same tolerances.

It seems that the manufacturers' tolerance on such a scale which is eventually to be used indoors and on one which is eventually to be used outdoors might well be the same. There seems to be no good reason why a manufacturer should be allowed a larger tolerance in his factory operations because the scale is eventually to be installed outdoors. Therefore, this table has been amended to provide that the manufacturer shall be allowed the same tolerance on such a scale whether of class A or of class B, that tolerance to be the present manufacturers' tolerance on class A scales. The users' tolerance—

Digitized by Google

that is, the tolerance applicable after the scale is put into use and used in an outdoor location—remains undisturbed.

While that seems to be an important change because it cuts the manufacturers' tolerance on certain classes of scales in half, it is our information that it will upset present manufacturing practice none at all. If any manufacturer here thinks otherwise, I wish that he would express himself at this time.

The ACTING CHAIRMAN. Does any manufacturer wish to express himself on this point?

Mr. ENGELHARD. Do I understand, Mr. Holbrook, that page 22 refers to manufacturers' tolerances?

Mr. HOLBROOK. It covers both manufacturers' and users' tolerances. The tabular values given are tolerances on scales in use. The manufacturers' tolerances are half of the values shown.

Now, in the case of certain class B scales we are recommending that the manufacturers' tolerances be one-fourth of the values shown here; in the case of all class A scales the manufacturers' tolerances will remain at one-half the value shown here. The result will be that the manufacturers' tolerances on all class A and some class B scales will be identical.

Mr. ENGELHARD. The heading of the table reads: "Table II—Tolerances for large-capacity scales." Are we to assume that that is for manufacturers? If class B is crossed out and not used in this table, then we only have one series. Is that to be used for manufacturers? It seems to me it is rather harsh. It is very severe to be used in actual field practice. In other words, this is for a manufacturer's guidance in the manufacture of his scale, is it not?

Mr. HOLBROOK. These tolerances are to guide the manufacturer in the manufacture of his scales, and also the weights and measures official in testing any scale, whether new or old.

Mr. TINKEY. Mr. Chairman, wouldn't it be a great deal better if this whole matter were reworded and rephrased, having only one class of scales, leaving the matter of tolerance up to the inspector, depending on whether the scale is inside or outside? He may find a scale today that is inside and tomorrow it may be outside.

Mr. HOLBROOK. The tolerance on a scale indoors today and outdoors tomorrow remains unchanged. For instance, a portable platform scale may be used in or out of doors, but portable platform scales always take the class A tolerance, in spite of the fact that they may at times be found out of doors. The only scales which are in question are scales which are permanently installed in position, either indoors or out of doors, and those will not change their position from day to day.

To clear up this matter, let us say that the present requirements are as follows: Dormant and built-in types, if they be installed indoors, take a class A tolerance; if installed out of doors, they take a class B tolerance. A portable scale takes a class A tolerance regardless of the place in which it is found, and scales of the railway track, motor truck, and wagon types are invariably of class B. It seems that is a perfectly proper distinction, because scales used indoors, of the dormant or built-in types, undoubtedly will be more easily maintained within class A tolerances than those identical scales when used outdoors.

Digitized by Google

This proposition which I have been presenting alters these requirements in one respect in relation to tolerances on some new scales of the class B type. Although some such scales may eventually be installed outdoors, during the manufacturing operation the manufacturer will not know whether the scale is going to be installed out of doors or indoors. Therefore, as I understand it, the manufacturer, in building a dormant or built-in type, adjusts his scale to comply with class A manufacturers' tolerances in all cases, in order to be safe. That is all we are requiring by the amendment proposed—that the manufacturer of a dormant or built-in type [5] comply with certain tolerances, to which we understand he is manufacturing at the present time.

(The amendment was duly adopted.)

Mr. HOLBROOK. If you will refer to page 23, J–1b, you will note two paragraphs which are explanatory of the application of the tolerances to railway track scales. This material has been amended to bring it into line with present-day practice. The second paragraph reads:

In order that the largest algebraic mean of any two errors, which represents the maximum error of freight-car weighing, may not differ appreciably from the true amount, a test car having a wheel base not exceeding 7 feet should be used.

It has been suggested that the standard requirement is that a load of not less than 30,000 pounds should be used in testing a railway track scale. To bring this point out, we now recommend the addition, after the words "7 feet", of the words "and weighing not less than 30,000 pounds." That simply makes this conform with good railway track scale testing practice.

(The amendment was duly adopted.)

Mr. HOLBROOK. Referring to page 25, table IV, we find that by inadvertance we have omitted the tolerances for straight-face spring scales altogether. The tolerances for straight-face spring scales under the old codes were specified as four times the values shown in this table. It is recommended that that omission be corrected by inserting within a bracket the following words after the heading of the table, namely, "Tolerances for straight-face spring scales are four times the values shown." That corrects an omission and is not new material.

(A motion was made and seconded that the insertion be made, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. Happily we have reached the last page of the document, page 28. The regulation which appears as K–4 has been amended to read:

Level condition.—All portable scales designed to be set on a counter or table or on the floor shall be maintained in level.

This regulation has been somewhat amplified as to the type of scale included within its purview. We think this is a very reasonable requirement for all of the characters of scales included.

[5] Railway track scales have also been included in this class in order to make these tolerances uniform with the tolerances of the American Railway Engineering Association.

Digitized by Google

Mr. HARRISON. Mr. Chairman, I don't know whether it is important or not, but I would like to call attention to the fact that in this particular regulation the term "portable scales", as I understand it, does not mean the same thing that the term on page 22, "portable platform type", under the tolerance table, means. I would be very glad to be corrected if I am wrong.

Mr. HOLBROOK. The terms "portable platform" and "portable" are so nearly alike that they might be confused. The regulation might be amended to read:

All scales which are portable and are designed to be maintained on a counter or table, etc.

That will be in the interest of clarification, I think. I suggest that that language be adopted.

(The regulation, as proposed to be amended, was duly adopted.)

Mr. HOLBROOK. K–5 reads:

Free suspension.—All scales of the hanging type shall be freely suspended when in use.

This has been amplified to cover all hanging scales. Formerly it covered, as I recall it, spring scales alone. We think the requirement is proper as to all scales of the hanging type.

(The regulation, as proposed by the committee, was duly adopted.)

Mr. HOLBROOK. There has been one item omitted on this page. There is a general regulation on drainage reading:

Wet fish or other wet commodities shall be weighed only on scales the pan or platform of which will properly drain.

It is the opinion of the committee that that should be numbered K–7 and be inserted in its proper place. The last two paragraphs will then become K–8 and K–9, respectively. That is not new material. It is simply something that was omitted.

(The insertion, as recommended by the committee, was duly adopted.)

Mr. HOLBROOK. It is recommended that the following specifications be repealed:

Platform scales.—11. Any device for altering the sensibility of a scale shall be so limited in its adjustment that the beam can not be made unstable by the manipulation of the device.

The committee believes that this is an unfortunate specification. In platform scales the sensibility reciprocal of the beam is usually adjusted by raising or lowering the balance ball assembly. In order that the manufacturer may provide an adjustment which will be sufficient at all times during the useful life of the scale, it is believed that the device as furnished new will often be such that when it is raised to its highest point the scale will be unstable. However, we believe that that is perfectly reasonable, since, were it otherwise, we feel that during the useful life of the scale a point would be reached at which the balance ball assembly could not be raised to a point sufficient to bring the sensibility reciprocal of the scale within the requirements. Therefore, the committee suggests repeal of that specification.

(The specification was duly repealed.)

Digitized by Google

Mr. HOLBROOK. Under the heading "Counter Scales", specification 9 reads as follows:

No. 9. On scales of the equal-arm type with stabilized pans—that is, pans above the beam—the under connections and a line connecting the outer knife-edges in the beam shall form a parallelogram. These under connections shall be straight and work freely.

No weights and measures official ever determined whether a parallelogram was achieved in a scale of this type except by means of a shift test. In other words, if the shift test requirements are not complied with, the scale is condemned. It may be condemned because four lines do not form a parallelogram, but the sealer will never know whether the lines form a parallelogram or not. Therefore, inasmuch as the condition aimed at is determined by the application of the shift test, and the decision made according to the performance on such test, we believe that the specification should be repealed.

(The specification was duly repealed.)

Mr. HOLBROOK. Your attention has now been directed to all changes. The committee believes that no other new requirements are presented in this report. However, this has been a tremendous job, and the committee is by no means certain that every one of the old provisions is incorporated. Also we would like to see this code made as good as we know how to make it. There are one or two places where the committee has already seen that the language can be slightly improved and clarified. The committee would therefore suggest that the resolution adopted last year in relation to this matter [6] be continued by the present Conference so that we may make this check on completeness, and so that if we find anything wrong or susceptible of improvement we may make corrections and changes of language without referring the document back to the Conference. If that resolution is continued, the committee will expect to make changes of this character.

Mr. ENGELHARD. If you will refer to page 17, in each one of the various paragraphs you will find that the words "person weigher" are incorporated. Referring to pages 15 and 16, in the requirements for prescription scales and balances, you will find these words are not incorporated in the separate paragraphs. However, I find that on page 15 the entire subject under heading F applies only to prescription scales and balances.

In other words, if one picks up the sheet and looks at F–3d, he reads: "All Class B scales and balances shall be conspicuously marked with the words 'Class B. Not to be used in weighing loads of less than 10 grains', or with a similar and suitable wording conveying the same information." If we take that out of its context in F, it seems to require practically every scale on the market to have that marking. If we leave it in its context, it is plain that it refers merely to prescription scales and balances. I wonder if all paragraphs should not be in the same form, and should not all of them state the particular type of scale covered? With that thought in mind, I move that the committee be empowered to change, if necessary or if they find it advisable, the wording of this material without altering its meaning.

Mr. HOLBROOK. As I understood it, the gentleman makes a motion to give the committee the authority to change the form and phrase-

[6] See p. 117 for the text of this resolution.

Digitized by Google

ology of these specifications without changing the meaning. I suggest this could be accomplished by continuing the resolution which I read at the beginning of this discussion, as follows:

Whereas the National Bureau of Standards may find it possible during the coming year to republish Miscellaneous Publication M85, containing all codes of specifications and tolerances of the National Conference on Weights and Measures, for the use of officials; and the codes should thus be in as good form as possible for the convenience of the officials: Therefore be it

Resolved, That the Committee on Specifications and Tolerances be given authority to reword the requirements without changing their meaning and effect, to make any desirable rearrangement and renumbering of paragraphs, and to amend cross references as to applicable codes, in the interest of brevity, good form, avoidance of unnecessary repetition, and satisfactory classification.

Mr. SWEENEY. I second the motion.

(The question was taken, and the motion was agreed to.)

The ACTING CHAIRMAN. Is Mr. Lang in the hall? I would like to have him assume the chair.

Mr. WOODLAND. Mr. Lang was suddenly called home and left yesterday.

Mr. TINKEY. There are two matters on which I would like to get this committee's respectful consideration during the next year. The first I have is on page 28, under K–6. There you set up a minimum-weight graduation on scales used in the sale of foodstuffs. There is added a proviso reading: "Provided, however, that this shall not apply to scales used exclusively in the sale of vegetables." I think consideration should be given to the proper minimum graduation for a scale used in the sale of vegetables. Should it be 2, 3, 4 ounces, or what? I believe that ought to be considered.

The other suggestion refers to material on page 9, under B–2m (4), all that after the word "provided", which allows the double sighting line on scales. We have deleted that in Ohio, and there is no reaction from any manufacturer. The scales are no longer made that way, and it seems to me that that could be deleted or be limited to apply to scales used for scientific purposes only. We use it scientifically, but not commercially. We find it facilitates the perpetration of fraud to have too many reading lines on the scale. The main thing is not to have the real indicator set too far away from the chart. It is difficult to control the matter. It is a better thing to have the additional indicator eliminated entirely.

Those two things I would like to present to the committee for their consideration.

The ACTING CHAIRMAN. Those are substantive changes and would be considered by the committee in regular course next year.

Mr. TINKEY. Yes.

Mr. HOLBROOK. To return to the code just considered: The committee perhaps had the right to make such a major operation as has been made on these codes. However, since it was found possible to bring the matter before the Conference, the committee would very much prefer that the Conference consider what is to be done with the document rather than have the committee proceed upon the authority granted last year. I think it would be fairer to the membership.

Digitized by Google

The ACTING CHAIRMAN. You mean we should take some action in regard to this document?

Mr. SWEENEY. Suppose that we should move at this time that all changes in the specifications which have been submitted by the Committee on Specifications and Tolerances, and which have been adopted here, together with the remaining specifications which have been changed in form but not in meaning be adopted at this time, with the proviso, of course, that further changes of the character suggested in the resolution just passed be allowed.

The ACTING CHAIRMAN. You have acted individually on those portions which appeared to demand individual action and consideration. The rest of the document presents requirements previously existing in our specifications, tolerances, and regulations. However, this comes to you as an entirely new document and in a different form. I think that if the sense of this body is to this effect, that this document as presented to you, namely, the report of the committee as of this date, should be accepted in toto. That would clear the records and probably be the proper thing to do. Is that your idea, Mr. Holbrook?

Mr. HOLBROOK. Yes; provided the Conference desires to take such action. The members have had this document in their hands for 48 hours. If they are convinced that the committee has made a good job of it, if they like the work that has been done, if they are satisfied with the present form and content, it might be adopted as a whole.

Mr. GRIFFITH. I think it is the consensus of opinion of the Conference, and therefore in order to bring the matter to a propositional form I move the adoption of the general report of the Committee on Specifications and Tolerances, as amended during the discussion.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. I think it fitting at this time to say that we are very grateful to Mark J. J. Harrison for a very competent reading of this document and for the several very valuable suggestions which he has made, some of which have been adopted by the Conference.

The remaining sections of the report of the Committee on Specifications and Tolerances covers modification of codes for milk bottles and liquid-measuring devices.

SECTION ON MILK BOTTLES

The first portion of specification 3 under the heading "Milk Bottles" now reads as follows:

Milk bottles with an inside diameter of not over 2 inches immediately below the cap seat or stopple shall hold the correct capacity when filled to within one-fourth inch of this cap seat or stopple; bottles with an inside diameter of over this amount immediately below the cap seat or stopple shall hold the correct capacity when filled to within one-eighth inch of this cap seat or stopple: Provided, however, That a larger distance shall be allowed below the cap seat or stopple when the bottles are provided with a clearly defined line blown or otherwise clearly and permanently marked in or on the bottle, and extending at least halfway around it, which indicates the correct capacity, and directly over, below, or beside this line, with the words "Fill to line" or a similar and suitable inscription clearly and permanently marked in or on the bottle. The distance between the line herein mentioned and the cap seat or stopple shall in no case exceed that given in the table below.

Digitized by Google

We now are confronted with milk bottles that have no cap seats but are to be used with a closure over the top of the bottle. The committee is of the opinion that requirements should be applied to these equivalent to those formerly applied to bottles that had a cap seat. The general language of the above paragraph has also been modified to some extent, but that is the main purpose of the amendment which will be presented.

Now, perhaps you remember that last year the committee proposed an amendment to this same general effect. At that time a representative of the glass industry was present and made some objection to the ¼-inch filling point provided for below the cap seat or stopple or the plane of the sealing surface. In view of the fact that the objection was made at the "nth" hour, the committee recommended to the Conference that the amendment be withdrawn, and it was accordingly withdrawn.

Now we have no official recommendation from the glass industry this year. However, we do have a recommendation from the International Association of Milk Dealers to the effect that the bottle should hold its correct capacity when filled to within one-fourth of an inch of the plane of the sealing surface. They say that that distance is necessary to take care of ordinary expansion of the milk—to prevent its running over the top of the cap in certain cases of increase in temperature.

In spite of the fact that the glass industry has made no recommendation, the committee again brings forward this specification, which is in effect the same recommendation made last year, and places it before you for your consideration [reading]:

Milk bottles with an inside diameter of not over 2 inches immediately below the plane of the sealing surface shall hold the correct capacity when filled to a point one-fourth inch below the plane of the sealing surface; bottles with an inside diameter of more than 2 inches shall hold the correct capacity when filled to a point one-eighth inch below such plane: Provided, however, That a larger distance shall be allowed below the plane of the sealing surface when the bottles are provided with a clearly defined line blown or otherwise clearly and permanently marked in or on the bottle, and extending at least half way around it, which indicates the correct capacity, and directly over, below, or beside this line, with the words "Fill to line" or a similar and suitable inscription clearly and permanently marked in or on the bottle. The distance between the line herein mentioned and the plane of the sealing surface shall in no case exceed that given in the table below.

Mr. GRIFFITH. What effect has this on bottles that are used by crowning with a metal cap? In that instance the plane of the sealing surface would be across the top of the bottle. Sometimes this metal cap is used alone, and sometimes in combination with the cardboard stopple.

Mr. HOLBROOK. The plane of the sealing surface would be the lowest point at which the capacity of the bottle was limited. If a bottle had a crown cap and also a cardboard stopper, the bottle should be measured to within one-fourth of an inch of the cardboard stopper, as that would be the lowest sealing surface encountered.

Mr. GRIFFITH. That corresponds with the bottle that has been in use for years and years. What should be done when they use the crown alone?

Mr. HOLBROOK. Then the point at which the bottle should be measured would be one-fourth inch below that crown.

95684—37——10

Digitized by Google

Mr. GRIFFITH. Then the height of these bottles would be somewhat different.

Mr. HOLBROOK. It would hardly be distinguishable, the bottles would be so nearly alike.

(The specification as presented by the committee was duly adopted.)

Mr. HOLBROOK. The following amendment is also proposed:

Tolerances.—Amend by adding to the tolerance table the 1- and 2-gallon sizes with tolerances as follows:

Capacity	Table A, tolerance on individual bottle		Table B, tolerance on average capacity		Table C, special tolerance for individual bottles in use			
					In excess		In deficiency	
	Drams	Cu in.	*Drams*	Cu in.	*Drams*	Cu in.	*Drams*	Cu in.
2 gallons	18	4.1	4.5	1.0	18	4.1	9	2.0
1 gallon	10	2.3	2.5	0.6	10	2.3	5	1.2

One- and two-gallon milk bottles have always been allowed under our specifications. However, we have no adopted tolerances for them. The tolerances proposed here have been obtained by extending the present tolerance curve and picking off these values direct. It was suggested last year by the glass industry that these tolerances were too small. They recommended a very much larger tolerance in the case of the 2-gallon bottles. However, it appeared to the committee that it should be possible to make the bottles within the tolerances herein given, and therefore the committee presents this to you in the same form in which it was presented last year.

(The amendment was duly adopted.)

SECTION ON LIQUID-MEASURING DEVICES

Mr. HOLBROOK. Your committee recommends that specification 6, under the heading of "Liquid-Measuring Devices", in paragraph 2, line 4, be amended by striking out the words "resulting from" and insert in lieu thereof the words "due solely to", to make this portion of the paragraph read as follows:

A special elapsed-time test shall be made to determine whether the device is satisfactory with respect to condition (3) above. In order to comply with this test, the condition of the device shall be such that the error due solely to the nonuse of the device does not exceed 2 cubic inches per hour in the case of a retail device and 5 cubic inches per hour in the case of a wholesale device: Provided, however, That in the case of a new device the permissible errors shall be one-half the values given above.

The committee considers that the proposed language is identical in meaning with the present language, but the change is made as a matter of clarification because it was suggested that the old language was not always understood.

(The amendment was duly adopted.)

Mr. HOLBROOK. Specification 8, under the heading "Liquid-Measuring Devices", reads as follows:

Interlocking of registering elements.—*A liquid-measuring device in which is incorporated (1) a computing mechanism which indicates the total price of the amount of commodity delivered, for one of a series of unit prices for which the mechanism is set, and (2) a unit price mechanism by means of which one*

Digitized by Google

of the various unit prices is displayed on the device, shall be so designed and constructed that these two mechanisms are mechanically interlocked so that when the computing mechanism is set for a certain unit price, this unit price and no other shall be displayed on the device.

It is recommended that the above material be amended to read as follows:

A liquid-measuring device in which is incorporated a computing mechanism which indicates the total price of the amount of commodity delivered, for one of a series of unit prices, shall also be equipped with a unit price mechanism by means of which the unit price at which the total price is being computed at any time shall be displayed on each face of the device.

That is a very important rewording of the old specification. The old specification did not require a unit price mechanism to be built into the pump. The present specification requires such a unit price mechanism, and it is provided that the unit price mechanism shall be such that no price may be shown except that particular price at which the device is computing at any particular time.

Also, the old specification was complied with if the unit price at which computations were being made was shown at one point on the pump. The amended language requires that that price at which the computations are being made shall be displayed on each face of the device.

In view of the fundamental nature of the changes made, it is recommended that this specification be not put into force and effect before July 1, 1937.

Mr. WHITE. Is that retroactive?

Mr. HOLBROOK. No; it is not. That is what the underlining means throughout.

(The specification as recommended by the committee was duly adopted.)

Mr. HOLBROOK. Specification 34 reads as follows:

Return of indicating element to zero.—Retail devices shall be so designed and constructed that the indicating elements used to tally sales and deliveries to individual purchasers or to indicate the amount delivered when any portion of the cycle or stroke has been completed, or the total price thereof, shall be returnable readily to a definite and clear zero indication before the next delivery is begun. *Means shall be provided to prevent the indicating element from being returned beyond the zero graduation. The indicating elements may be advanced only by the mechanical operation of the device itself:* Provided, however, That the device may be cleared by advancing the indicating elements, but in this event the registration shall be obscured and remain obscured until the zero is reached.

It is recommended that the proviso be amended to read as follows:

Provided, however, That the device may be cleared by advancing the indicating elements to zero, but only when the means employed automatically results either in a movement that cannot be interrupted or in an obscuring of the registration, until the zero position is reached.

Of course, the intent of the specification is obvious. By manual means no one shall be able to indicate on the device a greater amount of liquid than has actually been delivered, and, in general, that is prevented by requiring the indicating elements to be turned backward to zero. However, it was recognized last year that it would not do any harm, and that the pump could not be used fraudulently, if the manner of the return to zero was such that the elements were turned forward, provided during the time the elements were being turned forward the registration was obscured. That prevents the advance

Digitized by Google

of an indication for which the customer could be required to pay, because after the advance has been started no indication of delivery remains upon the device.

Now it seems that there is another way which is also foolproof by which this can be accomplished, namely, by advancing the registration, provided that when the advance is started it cannot be interrupted until after zero is reached. Obviously no one can be charged for an advanced indication while the indicating elements are spinning around returning to zero. Since this construction appears to be entirely satisfactory, the proviso is being amplified to allow such a return to zero.

(The amendment was duly adopted.)

SUPERVISION OVER MEATS AND MEAT PRODUCTS UNDER THE FEDERAL MEAT INSPECTION ACT

By ROBERT H. KERR, *Senior Chemist, Bureau of Animal Industry, United States Department of Agriculture*

Control over weights and measures of meats and meat food products exercised by the Department of Agriculture is effected under the authority of three laws, namely, the Federal Food and Drugs Act, the Federal Meat Inspection Act, and the Packers and Stockyards Act. The last two of these are administered by the Bureau of Animal Industry, the former by the Food and Drug Administration.

Under the Federal Meat Inspection Act, meats and meat food products, except those derived from farm slaughtering and those distributed by retail dealers to their customers, are required to be inspected by the Department of Agriculture if transported in the channels of interstate or foreign commerce. Before engaging in the interstate shipment of meats and meat food products, establishments must apply to the Department for inspection. After the establishment has been surveyed and found to meet the standards of sanitation, construction, and equipment, after suitable facilities for inspection have been provided, and other requirements not necessary to enumerate here have been met, inspection is inaugurated. Inspection includes ante-mortem and post-mortem inspection of the animals slaughtered, supervision over all processing and preparation, supervision of sanitation, and supervision over labeling. Meat and products found to be sound, clean, healthful, wholesome, and otherwise fit for human food, are marked "U. S. Inspected and Passed by Department of Agriculture", and may then be transported in the channels of interstate or foreign commerce. All carcasses and parts thereof, as well as meats and meat food products which are found to be diseased, unsound, unhealthful, unwholesome, or otherwise unfit for human food, are required to be destroyed for food purposes, within the establishment.

The Meat Inspection Act requires that when any meat or meat food product is placed or packed in any can, pot, tin, canvas, or other receptacle or covering, there shall be applied to such container a label which shall show that the product has been inspected and passed. The law in itself does not directly require application of any statement other than the marks of inspection but does prohibit the application of any false or deceptive name, and provides for the appli-

Digitized by Google

cation of trade names which are not false or deceptive and which have been approved by the Secretary of Agriculture. Under the regulations for the enforcement of the act, it is required that all trade labels be submitted for approval and approved before being used. To be acceptable for approval, a trade label must embody the true name of the product and the inspection legend, "U. S. Inspected and Passed by Department of Agriculture." The establishment number must also appear on the label except that in the case of canned products it may be embossed upon the can, or in the case of paraffined cartons for oleomargarine it may appear on the inside wrapper. The meat inspection regulations do not require the application of any statement of quantity but do prohibit the application of any false or misleading statement of quantity.

The application of statements of quantity by the establishments is, therefore, supervised by our inspectors to insure compliance with the regulation prohibiting false or misleading statements. This supervision is applied within the establishment and ends there. Once the product leaves the establishment properly labeled with a truthful statement of quantity, our supervision over the statement is ended. No attempt is made by the meat inspection service to follow the labeled article through the channels of trade to its destination to insure arrival or delivery with the statement of quantity correct.

Under the Packers and Stockyards Act, which is also administered by the Bureau of Animal Industry, the Department of Agriculture has authority to deal with unfair trade practices engaged in by establishments subject to the act. This authority includes authority to deal with unfair practices respecting weights and statements of quantity. Procedure under the Packers and Stockyards Act includes investigation of complaints, issuance of cease and desist orders when justified and necessary, and when necessary appropriate court action to enforce compliance.

Under the Food and Drugs Act all foods, including meat and meat food products shipped in interstate commerce in package form, are required to bear a statement of quantity. On account of this requirement of the Food and Drugs Act, practically all meats and meat food products shipped from establishments operating under Federal meat inspection inclosed in immediate or true containers are labeled with statements of quantity. As the meat inspection regulations require statements of quantity to be correct, and since precautions are taken by our inspectors to see that such statements are correct at the time the meat or product leaves the establishment, meats and meat food products moving interstate in package form may be expected to bear correct statements of quantity unless changes affecting the weight or volume have taken place after the product has been shipped from the establishment and moved beyond the supervision of our inspectors.

Meats and meat food products distributed from establishments operating under Federal meat inspection in package form and bearing statements of quantity include the following:

1. Canned meats and meat food products.
2. Wrapped and packaged hams, bacon, and other cured and smoked meats.
3. Sliced bacon, pork loin, dried beef, and like sliced cured meats.

Digitized by Google

4. Lard, compound, and lard substitute in pails, cans, tubs, and tierces.
5. Lard, compound, and oleomargarine in cartons.
6. Cooked hams, loaves, and cooked meats in cartons and wrappers.
7. Fresh and frozen meat and edible organs and parts.

Canned meats and products are not ordinarily subject to changes in weight or volume in handling, storage, or transportation. There are, however, some interesting exceptions, for example pigs feet in vinegar. This product is subject to a slow hydrolysis of the connective tissue, so that when it is stored for a long time part of the tissues become dissolved. In consequence of this change the weight of the solid material in the container slowly decreases with a corresponding increase in the weight of the liquid. The fact that such a change takes place has been cited in support of a request for acceptance of the entire contents of the jar as the true net weight. This request has, however, been declined on the ground that the changes when sufficient to affect the weight of solids to a material degree render the product unacceptable as an article of food and that in any case the food in the container consists of the pigs feet, so that the vinegar, which is used as a packing fluid and is ordinarily discarded by the consumer, ought not to be regarded as a part of the food in the package. However, in view of the fact that some alteration of the weight of the solids does in fact take place before the product becomes unsuitable for food, a moderate and reasonable understatement of weight is permitted.

In the approval of labels for cured meats and meat food products, as well as in the supervision over the application of statements of quantity, distinction must be made between products which are of such a character and are so labeled as to warrant inclusion of the entire contents of the can in the statement of weight and those in which part of the contents are not so included. An example of the first type is canned corned beef. An example of the second type is frankfurter style sausage in brine. While the proper labeling and classification of the two products cited involves no difficulty, other products are not so readily classified. For example, canned hams may be precooked, inclosed in a can, and processed in such manner that the contents of the finished can consist almost exclusively of solid meat. Such a canned ham may quite properly be labeled "Canned Ham" and bear a statement of weight inclusive of the entire contents of the can. On the other hand, an uncooked ham may be inclosed in a can and processed without precooking. In such case the can will contain a considerable quantity of juice or jelly cooked out in processing. Such a can might properly be labeled "Ham" and bear a statement of weight showing the quantity of cooked ham contained in the can, but more correctly should be labeled "Ham With Natural Juices" and bear a statement of weight including the entire contents of the can.

However labeled and whether the net weight is that of the entire contents or that of the food less a packing medium, the net weight of canned meats and meat food products found in the channels of trade should be correct if a correct statement of weight is applied in the first instance. Incorrect statements of weight, if found, are indicative of faulty practice on the part of the establishment preparing the product.

Digitized by Google

Wrapped hams, bacon, and other smoked meats contain considerable proportions of moisture and are, therefore, subject to loss by evaporation in the channels of transportation and trade. Losses of moisture may vary over a rather wide range due to variation in the quantity of moisture contained in the meat, permeability of the wrappings, and conditions of shipment. For example, a dry cured ham which has been subjected to long smoking and hanging, so that it has dried out to a total weight materially less than that of the original fresh ham, would naturally suffer little loss of weight even in a prolonged period of shipment or storage. On the other hand, a sweet pickle ham which has been lightly smoked, so that its weight is still somewhat greater than the original weight of the fresh ham, may lose weight rather rapidly unless well protected by heavy wrappings and shipped under refrigeration under conditions of relatively high humidity. In addition to loss of weight by evaporation of moisture, smoked meats may also lose weight by dripping of fat and by absorption of fat and meat juices by the paper used for wrapping. The latter possibility makes the application of gross, tare, and net weights to smoked meat at the time of wrapping unreliable unless the character of the wrappings is such that no change in the tare weight can occur.

On account of its high proportion of fat and correspondingly low water content, sliced bacon in cartons and wrappers is not subject to significant loss of moisture in storage or transportation. Sliced dried beef and pork loin are more liable to loss in weight. The wax paper, parchment paper, or Cellophane in which these products are commonly packed, does not readily absorb fats or meat juices.

The kinds of sausage shipped in package form and bearing net-weight statements include fresh pork sausage in casings and bulk, frankfurter and bologna style sausage, dry or summer sausage, and pork rolls in canvas. Fresh pork sausage usually contains a considerable proportion of fat, and on that account does not lose weight readily, particularly at low temperatures. Cartons and cups used as containers of pork sausage are usually paraffined. The wrappings commonly used, parchment paper and Cellophane, are not highly absorbent. Fresh pork sausage is, therefore, unlikely to lose much weight in transportation or storage. Frankfurter style and bologna style sausage normally contain more moisture than fresh pork sausage, and the wrappings ordinarily used for these types of sausage are not such as to limit evaporation effectively. These types of sausage may, therefore, be expected to lose weight rather rapidly in handling. However, the time period normally elapsing between shipment and consumption is ordinarily short.

Dry or summer sausage is usually well dried out in the course of manufacture. Such product is not, therefore, likely to lose much weight in the channels of trade.

Pork rolls and other sausage packed in canvas bags tend to lose weight rather rapidly. Unless paraffined, the canvas bags permit evaporation to take place rather readily. Net-weight statements applied to such product at the time of packing may, therefore, be expected to become incorrect within a relatively short time.

Loaves, cooked hams, and other cooked meats and products distributed in wrappers or cartons bearing trade labels and net-weight statements, are relatively high in moisture content. The wrappers

Digitized by Google

are ordinarily not such as to correctly inhibit evaporation. However, these products are ordinarily consumed soon after shipment from the establishment in which they are prepared.

Lard, compounds, and lard substitutes in pails, cans, tubs, and tierces are not subject to loss of weight. An accurate statement of weight can, therefore, be applied in the establishment with assurance that the quantity declared will reach the consumer.

Similarly lard, compound, and oleomargarine in cartons are not readily subject to changes in weight if properly handled. When these products are exposed to excessively high temperatures, however, softening and leakage may take place. Otherwise the quantity originally packed into the carton will reach the consumer.

Fresh and frozen meats are not frequently distributed in consumer packages. An exception is the so-called quick-frozen meat packed and distributed in small consumer packages. This product being held and distributed in the frozen condition is not subject to significant changes in weight. When chilled, unfrozen meat is distributed in packages, it is liable to rather rapid losses in moisture and to absorption of fat and meat juices by packing materials. The packaging of chilled meats must, therefore, be handled under conditions approaching ideal if the product is to reach its destination without significant losses.

It should be remembered that the food constituents of all meats are the proteins, fats, and mineral salts, none of which are lost through evaporation of moisture. A wrapped ham, for example, which is shipped from the establishment weighing 16 pounds and arrives at its destination weighing 15 pounds 10 ounces is still the same ham and represents the same quantity of food as when it weighed 16 pounds. This is not to be taken as warranting misrepresentation of weights, as an excuse for short weight, or as excusing packers, distributers, or dealers from making every effort to state the weights correctly. However, it may be taken as warranting some tolerance for such losses in weight as are due entirely to evaporation.

Losses in weight are materially affected by conditions of shipment and storage. Regulation of humidity in coolers and storage rooms is becoming increasingly common. One of the objects prompting the regulation of humidity under commercial conditions is to minimize shrink. This may sometimes mean that a part of the shrink formerly incurred by the packer or his branch establishment is now being shifted to the retail dealer or to the ultimate consumer. The regulation of humidity as a part of the operation known as air conditioning affects the changes in weight taking place in meat held in air-conditioned coolers. That evaporation of moisture from meat will take place more rapidly in a cooler in which relative humidity is not controlled and may at times fall to a lower point than in one in which the relative humidity is controlled and carefully held at the highest practicable point is self-evident. Temperatures and air circulation are also significant factors. On account of the variations in factors affecting changes in weight, it is not possible to state in definite terms the amount of change which may be expected to take place in any meat or product under conditions of commercial distribution. As previously indicated, the net-weight statement applied to packages of meat and meat food product in establishments operating

Digitized by Google

under our inspection is required to be correct at the time of application and to be kept correct until the product is shipped from the establishment and thereby passes beyond the scope of our inspection. In the case of products known to be subject to changes in weight, a moderate and reasonable understatement of weight, such as will insure correctness when the product arrives at its destination, is not objected to. Establishments are not, however, required to apply understatements in weight for the purpose indicated, neither are they permitted to apply such understatements as might constitute an evasion of their legal obligation to state the weights correctly. For example, an establishment might be permitted to apply the statement, "Net Weight 16 Pounds", to a wrapped ham weighing 16 pounds 6 ounces at the time of shipment but would not be permitted to apply a statement reading, "Net Weight 11 Pounds" to the same ham.

In conclusion, attention is called to the fact that inspection under the Federal Meat Inspection Act is directed to the prevention of violations of law rather than to the detection and punishment of offences after they have been committed. The only offense for which the meat inspection act provides a penalty is the interstate shipment of uninspected meat or meat food product, an offense which an establishment operating under Federal meat inspection is obviously unlikely to commit. Accordingly, our efforts are directed toward preventing the shipment of products which are not marked with a truthful statement of weight rather than toward discovery of incorrectly marked products in the channels of trade and subsequent prosecution of the offenders. If, therefore, our inspectors should find U. S. inspected and passed meat or product which has entered the channels of trade bearing an incorrect statement of weight, corrective action would be taken through and by the inspectors at the establishment where the incorrectly marked product originated. The action taken would be directed to the correction of the faulty practices which led to the incorrect weights, thus eliminating the incorrect marking at its source. Should products originating in establishments operating under Federal meat inspection, which are not or which appear not to be properly marked with respect to weight or volume, be found in the channels of trade, the Bureau would appreciate being advised of all the facts so that corrective action can be taken at the establishment from which the product is distributed. The meat inspection regulations provide for cooperation between inspectors in charge and local authorities. Members of this conference located at points where Federal meat inspection is maintained may, therefore, confer directly with the local inspector in charge should inspected and passed meat or product which appears to bear an incorrect statement of weight be found. Members not located at such points may bring the matter directly to the attention of the Bureau. Application of correct statements of quantity at the establishment, reasonable tolerance being allowed for the variations necessarily incident to the packing of commercial products and for the charges in weight to which such moist and perishable products as meat are necessarily subject, should leave little ground for complaint. Bureau inspectors are engaged in continuous supervision over the application of statements of weight to make sure that meats and meat food products leave the establishment correctly marked in that respect.

Digitized by Google

DISCUSSION OF ABOVE PAPER

Mr. BOYLE. In my observation, baked ham is being marketed in a carton bearing the legend "U. S. Government Inspected and Passed", with the establishment number left blank. There is also an imprint on the ham itself. The boxes were shipped in from a neighboring State, from a branch not having Federal inspection service. They were prominently displayed in the various stores, and that legend appearing there led to the belief that that product had been inspected, which was not the case.

Dr. KERR. That sounds like a case for legal action. Perhaps an inspected branch had processed the ham and applied a misleading legend. The legend you quote is not the legend that we require.

Mr. BOYLE. It is possible that I haven't quoted the legend exactly as marked on the ham. The legend was a true legend insofar as the wording, but the establishment number was blank.

Dr. KERR. That was probably a matter of labeling, which we don't handle, but it sounds very much like a violation of law. I would suggest that you check up and, if it is still going on, bring it up.

Mr. WILHELM. There is 5 or 6 pounds of shrinkage on every 100 pounds of meat coming into Michigan from certain packers. They say you allow that shrinkage. How can we stop it? You will find meat with 3 pounds of paper and 2 pounds of shrinkage; you will find 95 pounds sold for 100. It is shipped from Omaha. Then you will find other companies that come right up to standard.

Dr. KERR. There will be no possibility of any action by the Bureau of Animal Industry so long as it leaves the Omaha establishment correctly marked. If it arrives in your jurisdiction incorrectly marked, you might handle it under your local laws, or if you have any evidence that it moved interstate incorrectly marked, that would be subject to action by the Food and Drugs Administration.

Mr. WILHELM. They mark on the bill "No allowance for shrinkage." I have sent you people a letter and I got a letter back, "Allow 2 percent", and I think that is too much. Two pounds of meat on 100 is a lot of meat. I want to know if we can't stop it some way besides bothering locally. They keep shipping it in. You can't stop every truck on the road.

Dr. KERR. That is a trade practice of billing the thing out at the original weight and not allowing shrinkage. That is a trade practice which, if it is indulged in systematically, might possibly be reached through the Packers and Stockyards Administration, or against which the dealers buying meat can protect themselves by paying only for the meat they get.

Mr. WILHELM. Isn't there some way this organization, through you people, can stop it from the other end? That is what I want to find out.

Dr. KERR. Possibly; if it is carried to such a point of business as to constitute unfair competition, the Packers and Stockyards Administration might be able to handle it under the Packers and Stockyards Act. The Meat Inspection Service can't do anything about it so long as it leaves the establishment properly marked.

Mr. WILHELM. All the argument they give me is that the Government allows it.

Dr. KERR. If you have a local law calling for correct weights, the fact that the Government lets it leave the establishment in Omaha

Digitized by Google

under certain markings doesn't relieve them of responsibility under the local law.

Mr. WILHELM. I know, but, locally, I don't think we can get at them.

Dr. KERR. That is one of those matters that the Constitution of the Republic leaves to local action. We have not the authority under the Meat Inspection Act to reach that.

We had a case that we handled not so long ago, entirely different. The State had a law against the application of artificial color to sausage casings, and one of the packers was coloring his sausage casings and he told the local authorities he was operating under Federal inspection and the meat inspection regulations of the Department of Agriculture permitted that, and he was going to go ahead and color his sausage. The inspector in charge wrote in and asked what he should do about it, and we told him that he should make himself available as a witness in case the local authorities entered prosecution, to give evidence that they did color their sausage. We did not excuse them for violating any local law.

Mr. WILHELM. Truthfully, locally I don't know what to do. They tell me the Government allows it, and they come in with about 10 lawyers.

Dr. KERR. Maybe if you took that battery of lawyers into court under your local law you would have some success.

Mr. WILHELM. They laugh at me when I mention local courts. That is why I came here, and that is what I am going to find out before I leave, because I am going to go back home there and argue.

Dr. KERR. We can do nothing under the Meat Inspection Act but see that the marking is correct when the product leaves the plant. We do not attempt to interfere with the operation of any local law, and where we can we give local authorities all the support possible in enforcing it.

Mr. WILHELM. If this meat leaves Omaha marked 119 pounds and it weighs only 113 when it gets to Michigan something is wrong. Even the boxes they ship the meat in weigh 1 or 2 pounds more than is actually marked on them. Your inspectors should notice that when it is shipped out. Then they should see them put all that heavy paper in there. Paper is 4 cents a pound and meat is 30 or 40. I see 3 or 4 pounds of paper on every 100 pounds of meat. They aren't all doing that, but certain packing houses are. I want to know why you don't stop them at the other end.

Dr. KERR. If there is any question about its being correct when it leaves the establishment, we can handle that. The question is how much meat was there when it went out of Omaha. They may have had a full 100 pounds, net.

Mr. WILHELM. I want to know if we can't, by resolution or otherwise, investigate it and try to do something.

Dr. KERR. If you will tell me which establishment it is I will investigate it.

(Mr. Wilhelm gave the names of two packers.)

Mr. WILHELM. I weighed meat from one packer the other day and it came right up. Another was short. If one can do it, why can't they all do it?

Dr. KERR. They can. Have you found this only from the Omaha standpoint?

Digitized by Google

Mr. WILHELM. All of them are doing it.

Dr. KERR. We need to know particulars. What we do is to go back to the establishment. We are particularly interested in the establishment. We look into the practices there. At the individual establishments they sometimes get sloppy in their habits and have to have a little direct action from the inspector.

Mr. WANDLING. Are you referring particularly to fresh butts and loins of pork? We have the same thing in the New Jersey jurisdiction. I have reweighed some—I guess 125 or more—packages, and found that the gross weight is labeled correctly in nearly every case. The net weight is generally missing. It runs from 1.5 to 3 pounds short on every package. I didn't get a correct net weight on a single one in some sixty boxes.

Then I go to the packing house and they tell me it is due to the chemical action of the freezing and unfreezing of the meat. I am wondering if anything like that could possibly occur, especially if the weights are branded correctly for the gross weight. Would paper absorb it and hold some of the weight?

Dr. KERR. Fresh pork is sometimes wrapped in paper that is somewhat absorbent; it will absorb fat and meat juices and gain in weight at the expense of the meat. That will happen in shipment.

Mr. WANDLING. It seems to me that we prosecute a butcher for short weight, yet these fellows get away with it. It isn't only in one instance; several packers are guilty.

Mr. ROBERTS. I would like to ask Dr. Kerr this question, whether or not the officials of the Department of Agriculture believe that these packers should be permitted to pass on to the purchaser, consequently to the ultimate consumer, these so-called shrinkages in weight? Is not the proper way to require the package to contain the full weight every time it is sold?

Dr. KERR. There is no question about that. The sale of anything that weighs other than what it is marked at the time of sale is wrong.

Mr. ROBERTS. Now, when the U. S. Department of Agriculture, or any other Government department, or my weights and measures department, begins to allow for shrinkage, who is going to determine how much the shrinkage has been?

Dr. KERR. We make no allowances for shrinkage. If the net weight is not correct at the time the product is packed and until the time it goes beyond our Department, then there is an offense against the Meat Inspection Act, and we will handle it. But after the product leaves the establishment, then it is gone beyond the control of the Meat Inspection Service, and there is nothing more we can do about it.

Mr. ROBERTS. Suppose a shipment of meat or a shipment of butter—I mention those two because they are the ones customarily of short weight—started from Chicago. The weight there is not taken by any Government official. It arrives in the District of Columbia, or in a State, and when it arrives it is short weight. Is there any action that the Department of Agriculture can take under the law?

Dr. KERR. There would be an offense against the Food and Drugs Act there for the interstate shipment of short-weight products. The interstate shipment of short-weight products is an offense against the Federal Food and Drugs Act rather than under the Meat Inspection Act.

Digitized by Google

Mr. ROBERTS. Now, suppose the Food and Drugs Administration weighs a carload of butter and they find it averages a fraction of an ounce per pound short weight. Then they undertake to calculate the amount of shrinkage that has taken place between the point of shipment and the point of destination. Isn't the true test this, that you must say to the packer, the processor, that he must put enough in his package so that it will reach the ultimate consumer full weight. Isn't that the answer?

Dr. KERR. That may be the answer, but that is a food and drugs question that I am not qualified to answer. I will say that if a packing house in Chicago, shipping a load of pork loins into the District of Columbia, wants to put 102 pounds in a box and label it 100 pounds so they can be sure that it will arrive in Washington weighing 100 pounds, we will let the packing house do that. However, if he tries to evade the requirements of the Food and Drugs Act by packing 100 pounds and marking 90 pounds, we will step in and object. We will allow him to make a moderate and reasonable understatement, to provide for arrival at destination of correct weight, or we will allow him to give the correct weight at the time of packing and take his own chances at the other end.

Mr. ROBERTS. Take his chances with whom?

Dr. KERR. With the local authorities at the other end, and the Federal Government. You are getting into a legal question that I don't pretend to talk about, but if you find short weight products in the District of Columbia, doesn't your local law cover it?

Mr. ROBERTS. Yes; our local law does, but I am talking about the Department of Agriculture. Suppose we prosecute a man under our local law and he sets up as a defense that the Department of Agriculture permits and approves it?

Mr. SWEENEY. It strikes me that the Federal Government has jurisdiction while the commodity is in transit. Just the moment it is delivered into the State it becomes part and parcel of the property of the State, and is subject to the laws and regulations of the State. If the discovery of the shortage is made during the period that the commodity is in the possession of the common carrier and on the grounds of the common carrier, then it comes within the purview of the Department of Agriculture or the Federal Government.

Mr. ROBERTS. I do not understand that to be the case.

Mr. WHITE. I would like to have that point clarified.

Mr. ROBERTS. My understanding is that so long as it is in the original package following shipment in interstate commerce it is under the jurisdiction of the Department of Agriculture.

The ACTING CHAIRMAN. I think the doctor has said that his jurisdiction is to control the product at the plant. Now, the Federal Food and Drugs Administration has frequently stepped in any time between shipment and arrival at the consignee. When the commodity has left the original consignee then we stepped in.

Mr. ROBERTS. I will tell you what I think is a rather effective way to stop it, although this allowance of shrinkage by the Department of Agriculture causes us more or less embarrassment. We say to the wholesaler here, and to the retailer, that every time this commodity is sold it must be full weight. I may say to my friend over there, if he prosecutes some of the people that handle this stuff in his State,

Digitized by Google

under local law, his local agency will see to it that it is shipped to him in full weight in the future. I will guarantee him that.

If you put some of those people in jail, they will see that the packers put enough meat in the boxes so it will reach the ultimate consumer full weight. I realize very well his situation, because they come up and say, "Here is the Agriculture Department allowing this and approving it."

The ACTING CHAIRMAN. The doctor says it is embarrassing to the Department, and that even though they are prone to say that, it doesn't mean anything.

Mr. ROBERTS. I am not sure whether it means anything or not. You understand, the Department of Agriculture does allow some shrinkage. Their principal object is to see that it was full weight at the time of shipment, and then whatever it really shrinks after that, according to what they consider it should shrink, they allow.

The point I am trying to make is that when you get into the question of shrinkage it is a question no one can decide. I can't decide how much a pound of butter should shrink between Chicago and Washington. The company comes in and puts witnesses on the stand who testify that this butter was weighed in Chicago and was full weight when it left. My answer is that that doesn't make any difference, that it is your duty to see that it is full weight when it reaches the ultimate consumer.

This matter of shrinkage is merely a scheme to pass on to the consumer all of the loss incident to merchandising and handling, and the consumer is not the person who should shoulder that.

Mr. O'KEEFE. We can always vouch for the fact that butter or any other package leaving Chicago is always full weight.

Mr. WHITE. Mr. Sweeney, of Massachusetts, made the statement that an original package, as soon as it left the hands of the common carrier, became subject to the laws of the State. I want to clarify that by asking Dr. Kerr if it isn't a fact that an original package originating without the boundaries of a State and shipped into a different State is interstate commerce and continues to be subject to Federal regulations so long as it remains in the original package, no matter how many times it comes to rest.

Dr. KERR. That is a question of how the courts have ruled on interstate commerce. I know that in some cases the courts have held products subject to the Federal jurisdiction while still in the original package, even though they had remained within the State for quite a long time. I am not lawyer enough to tell you at just what point the Federal jurisdiction ends and the State jurisdiction begins, but it is my understanding that a product which has once moved in interstate commerce is subject to Federal jurisdiction so long as it remains in the original unbroken package in which it was moved interstate.

Mr. WHITE. That is my understanding of it; and under that ruling is it possible for your Department or the correct Department of the Federal Government to send an inspector into the State and reweigh that package at the last place that it comes to rest before the retail dealer breaks it up into its several units and thereby determine the shortage and prosecute?

Dr. KERR. If I understand it correctly the Department has that authority, but that would be exercised through the Food and Drugs Administration rather than the Bureau of Animal Industry.

Digitized by Google

Mr. WHITE. I have been through this meat proposition and I feel certain that I can show you crates of pork loins marked around 104 pounds that will be 6 pounds short.

Mr. HOLBROOK. Mr. White, I understand the rule of law to be that the commodity in the original unbroken package does not become mixed with the general goods of the State until after the first sale within the State. I think that after the first sale within the State, whether it remains in the original package or not, the State can deal with it under its own regulations.

The ACTING CHAIRMAN. I think that that is right.

Mr. ROBERTS. I wonder if I might ask Dr. Kerr one more question. It is a question of what the lawyers of the Department of Agriculture hold in regard to the question Mr. White has raised. I wonder if he is informed as to what the Solicitor's Office of the Department of Agriculture has held.

Dr. KERR. I don't believe that that is just exactly my place. It is the lawyers' job to tell where interstate commerce begins and ends.

Mr. ROBERTS. It is the lawyers' duty to inform and act as legal consultant of the various divisions of the Department of Agriculture. If you make a formal request of the Solicitor's Office for an opinion on the question Mr. White has raised, I am sure the reply will be interesting.

Mr. ACKERMAN. I think we are trying to make this question entirely too complicated. All these cross-examinations of Dr. Kerr, and so on, are too involved. It looks like the problem is up to the local administrator, as Mr. Roberts has said. There is only one handicap, and that is to get the meat dealer to complain about the packer. We have had several complaints in Minneapolis along this line, and have investigated them and found that the complaints were warranted. Then when we got to the point where we wanted a prosecution we couldn't get the meat dealer who was affected to sign a complaint, because he owed the packer so much money that he was afraid the packer would cut off his supplies, and if he is stopped by one company the rest of them will cut him off too. We have convicted packers in Minneapolis a number of times. Our ordinances are such that we don't allow any tolerance at all. We had a case on borax that shrunk 4 ounces on a pound. They came in with their high-pressure attorney and their chemist to our local municipal court and tried to prove that the stuff was 60-percent moisture, and the answer was, "If you know it has so much moisture in it to start with you can put in an oversupply so it will be up to weight in Minneapolis. Keep it up to weight in Minneapolis or keep your product out of town." We didn't get any appeal to the Supreme Court on that either.

Mr. STROBRIDGE. I think we have discussed this so-called unavoidable shrinkage pretty thoroughly. A problem that we have concerns the processing of pickled tongues and corned beef. I want to know if there is any regulation of your Department, Doctor Kerr, that allows them to pump in an ordinary-sized tongue about 4 or 5 pounds of the liquid they use in processing and sell that to the housewife as meat? When you come to cook it, it will shrink up and it will be about four or five pounds less than the original amount was. The same is true of corned beef. Is there any regulation to govern the amount of moisture they can pump into a given amount of tongue or meat?

Digitized by Google

Dr. KERR. We have taken a stand on that, that they must not pump it in in such a way as to destroy the identity of the product and make it different from what the consumer expects to buy. At several places we have tied up quite a lot of tongue and briskets for smoking out. One establishment not long ago gave up their Federal inspection and ceased doing an interstate business because our inspectors wouldn't let them pump the tongues until they swelled and thus allow them to sell salt water for meat.

Mr. STROBRIDGE. How can we reach it when it is done by local butchers?

Dr. KERR. That is subject to local regulation.

Mr. STROBRIDGE. Is there any Federal regulation that will govern the amount of brine or pickle that can be pumped into this commodity?

Dr. KERR. We haven't written into the regulations anything about the practice. We have handled it through our inspection staff by observing the weights before and after curing and by chemical analysis of extractions from the product. We have held them to gains in weight that are incident to normal curing processes. We have tied up the product that was, in our opinion, adulterated with an excessive amount of moisture or brine.

Mr. DANIELS. I have a problem in reference to casing sausages. In Michigan we have a law whereby sausage is required to be graded, and that grade shall be marked upon the sausage.

We do have quite a lot of difficulty in the administration of the sausage law due to the manufacturers evading the marking of the sausage. I would like to ask the doctor if there are any Federal requirements as to cereals, or materials other than meat, put into sausages.

Dr. KERR. The meat-inspection regulations define sausage as a spiced and seasoned mixture of meat or meat and meat by-products. The regulations permit the addition of not more than 3.5 percent of cereal, in which event the sausage is required to be marked "Cereal added." Now, if the sausage or the container of it bears any statement indicative of grade or quality, it must conform to that quality. Label statements must be approved before they can be used, and they are approved only for products conforming to the label.

The ACTING CHAIRMAN. Gentlemen, Dr. Kerr is our guest and he has delivered an able paper, and we have covered quite a general ground of questioning. I don't want to say to anybody that we should not question him, but I do want to be considerate of the doctor. If the questions are new, probably the doctor will have no objections to answering them.

Mr. BLAYLOCK. This body should go on record as approving the Department asking Congress to pass a law providing that if a ham is marked in Chicago as weighing 25 pounds it must weigh 25 pounds when the housewife buys it.

Mr. O'KEEFE. You are talking about Chicago so much. Just because a ham is marked on the outside of the wrapper "25 pounds" doesn't mean a thing to us. If it is in the store for several days the storekeeper, under our ordinance, must unwrap that ham and sell it on his scale at its true weight to the customer.

Mr. F. G. SMITH. That is true of Connecticut, too, but why should the meat dealer take the loss, gentlemen? I have tried to contest

Digitized by Google

these things with the packing companies, but merchants won't go to bat. It seems to me if they can put up pecks of potatoes in bags and put enough in them to allow for shrinkage, they can do the same thing with meat, and the individual merchant in the State where the stuff is shipped will not have to take the loss. If a man pays for a 16-pound ham and he sells it at 15.5 pounds, he is losing half a pound, or else he raises the price in order to take care of it. It seems to me it should be taken care of at the source.

Mr. O'KEEFE. That, Mr. Chairman, is entirely outside of our jurisdiction. That is between the butcher and the packer.

The ACTING CHAIRMAN. I think Mr. Roberts had a suggestion, and the gentleman from Minneapolis, that the answer is to prosecute, and the packer will comply; but you have the difficulty that the storekeeper won't testify, for obvious reasons, as was stated by the gentleman.

Mr. TUCKER. For the gentleman's information, I might refer him to a decision made several months back. The demarcation of interstate shipments was involved in that case and it is all in that decision.

Dr. KERR. I had that decision in mind when I laid down the limits that we keep within. We don't attempt to do, under the Meat Inspection Act, what we have no right to do. We are glad to do all we can, but we don't propose to overstep our authority.

Mr. WILHELM. Dr. Kerr, you say the local authorities should take care of it. Can I get a letter from you, sent to me, telling me you are not responsible?

Dr. KERR. I think you can, if you write in.

Mr. WILHELM. I think the law is wrong, and I think you people can get after it to change the law in some way or another. I don't blame you, but somebody should find out where the trouble is and correct it.

Dr. KERR. There are quite a few people who think laws are wrong. Possibly I have my own opinion about some laws that are on the books, but I am obliged, in my work, to keep inside the law that I am working under.

Mr. BOOTH. We seem to have discussed this thing pro and con and haven't gotten very far. Several recommendations are being made to several branches, and if they will take them under consideration for the next year we might get somewhere.

At this time I would move that we proceed with the next order of business by offering Dr. Kerr a vote of thanks.

(The motion was seconded, the question was taken, and the motion was agreed to by a rising vote.)

The ACTING CHAIRMAN. What we want is somebody from Food and Drugs here some time.

THE REGULATION OF UTILITY METERS

By P. L. HOLLAND, *Chief Engineer, Public Service Commission, State of Maryland*

We are told in the Old Testament, which records the history of 4,000 years ago, that a false balance was then declared to be an abomination. Neither Biblical nor secular history records, until

Digitized by Google

3,000 years later, any constructive methods employed to prevent the injustice that might arise from the use of such instruments. Approximately 1,000 years ago King Edgar, of the Saxons, decreed that "The measure at Winchester shall be the standard." Provisions were made to check other weights and measures against the Winchester standards. Some of these units in practically unchanged form are in use today. During the last two centuries the demands of national and international trade have brought about standardization and a high degree of accuracy in weights and measures. The widespread membership and the intense activity of organizations represented here today give evidence to that effect. You furnish a considerable degree of protection to the buyers and sellers alike of practically every commodity that passes in trade. The need for such protection was realized many years ago.

The subject of this paper is the testing of meters used by the various public utilities in measuring services, or commodities, which by their nature are so necessary in our daily lives, as to set apart the vendors thereof as a specially privileged but closely regulated class of merchants. The number of such merchants is small, as compared to those engaged in other lines, but the number of customers represents a very large percentage of our total population. Approximately 75 percent of our population is served with electric energy—just one of the forms of service. When we add to this telephone, water, gas, steam, and taxicab services, all or part of which are sold on a metered basis, the magnitude of utility metering is apparent. Many of these services are new when compared to the concept of measurement by precise fundamental units, but they were developed during a period when the desirability or necessity of close supervision of other forms of measurement was apparent to all. I think it is a tribute to the public utility industry that even today the seal of approval, State or municipal, is required on such measuring devices in only a few States or cities. In three States and the District of Columbia gas meters must be tested and sealed by a State agency before being used, and, so far as I know, such testing is required on electric meters in only one State. The law of Maryland requires that no electric or gas meter shall be placed in service, or having been removed from service, shall be replaced, until approved, tested, and sealed by a representative of the public service commission. The magnitude of the task involved is indicated by the fact that up to the present time the inspectors of our commission have tested and sealed approximately 1,600,000 meters.

A large number of the States and some municipalities require the utility companies to maintain approved testing equipment and to make periodic tests, and in many States the utility commissions conduct referee tests upon application or complaint, and upon payment of a nominal fee.

Since Maryland appears to have the most stringent laws on this subject of testing, it may be of interest to recite some of the pertinent provisions. Under statutory law the public service commission is authorized to make such reasonable rules and regulations as may be deemed necessary to protect the utilities and the public and to insure safe and adequate service. The provision that all electric and gas meters be approved, tested, and sealed or stamped by a representative

Digitized by Google

of the commission is embodied in statutory law. Similar provisions relating to taximeters have been promulgated in the rules and regulations of the commission. Water and steam meters are tested only upon request or complaint.

Approximately one-half the population of Maryland is served by one utility with offices in Baltimore. Inspectors are employed full time in the electric and gas meter shops of this company, where all preinstallation tests are made. In the case of utilities operating elsewhere in the State, routine-inspection trips are made monthly, or more frequently if necessary, to central points, usually the larger cities served by the respective companies. On such trips the inspector not only makes preinstallation tests but takes care of any complaints that have accumulated.

In general, the procedure of testing is as follows: The larger companies are required to maintain laboratory equipment approved by the commission, consisting of working standards and reference standards—the latter being checked periodically by the National Bureau of Standards. The commission also maintains similar equipment and checks the equipment of the companies. Meters are approved as to type, usually after submission of sample meter by the manufacturer. In this work we have the full cooperation of all the leading manufacturing companies. Individual meters, of an approved type, are tested under two or more load conditions, and, in the case of electric meters, at varying power factor. Water and steam meters are tested by weighing water or condensate, using calibrated weights. At present we have no occasion to make volumetric measure of steam.

In the Maryland law relating to taximeters is a provision that charges shall be based on mileage only. A standard taximeter is provided with a clock constantly in mesh so that when the vehicle stops, or slows down very much, the recording device is kept in motion. Under our law this cannot be permitted, but at the same time it is realized that mechanical means must be provided for measuring and recording "waiting time" for which a separate tariff is filed. As a compromise, the clock mechanism is connected through a slotted drive, so that a period of 20 seconds elapses after the vehicle stops before the clock takes up the motion. This effectively eliminates any increase in registration as a result of delays due to stop lights and minor traffic congestion. This particular feature is cited because it complicates testing to the extent that in addition to the usual tests this delay mechanism must be checked by stop watch. In the case of taxicab fleets composed of vehicles of standard and uniform construction, meters are given a "bench test"—that is, calibrated by measured rotation of the drive shaft. However, so many various types of vehicles are used in Baltimore that, except for one fleet, the road test is necessary. This consists in riding each vehicle over a measured course. Such tests are made annually and also when equipment is changed or complaint made. This is not an inconsiderable task.

Measuring devices used by utility companies are usually machines, electrical or mechanical, or both, rather than simple standards of measure. As such, exact accuracy can not be expected. Tolerances, ample to take care of inherent errors, are permitted, but no

Digitized by Google

meter is allowed to be placed in service, or to remain in service, which is in error by more than 2 percent. As a rule, new and repaired meters are well within ½ to 1 percent error when installed.

A moot subject in regard to accuracy of utility meters is the length of time, or period, that a meter may remain in service without test. These periods vary greatly in the different States. The Public Service Commission of Maryland very recently issued revised rules and regulations governing gas service, which fix such periods for gas meters at 5 to 10 years, depending upon meter capacity. The periods for electric meters vary from 6 months to 5 years. Ten years is a rather long time, but data now available indicate that in the case of small gas meters, a very high degree of accuracy may be expected for that length of time. The inherent tendency of diaphragm type meters is to underregister, so whatever error creeps in is in favor of the customer rather than to his prejudice.

During the last few years the staff of the Maryland Commission has been devoting considerable time to the study of the economies of utility metering. Unaccounted for losses of gas or electric energy or water sometimes amount to alarming proportions of the total output. Work is in progress at present on one system in which the value of "lost" gas is sufficient to justify removing and testing all meters in the systems. Sometimes it is rather difficult to isolate the cause of unaccounted for losses, but if a systematic approach is made, the problem may be simplified.

An interesting fact was developed by engineers in studying the water supply and metering in New England. In a paper, presented some time ago before the New England Water Works Association, appears a curve showing the ratio at which water is used in domestic supply. Much to my surprise, nearly half the total is at the rate of 2 gallons per minute or less. Those of us who have had experience with water meters realize the difficulty of adjusting and maintaining meters in such a manner as to get accurate readings at very low flows. It is highly probable that 25 percent of water sold to domestic customers through meters is not recorded at all. Very few companies meter the supply and sales completely enough to check this loss.

Accurate metering is essential to good customer relations, but from a monetary point of view it is vastly more important to the utility concerned. This fact is appreciated by the larger companies, but in the case of small organizations, especially municipalities, its importance is often overlooked, as evidenced by one town in Maryland. Knowing that the electric meters were in need of checking, I offered the services of an inspector to assist in the instruction of the local metermen and in properly equipping the shop. A complete survey and test of meters resulted in a 25 percent increase in revenue. Needless to say, some customers were displeased, but the financial position of the town was improved.

REPORT OF COMMITTEE ON CONSTITUTION AND BYLAWS

MAJORITY REPORT PRESENTED BY C. D. BAUCOM, CHAIRMAN

Gentlemen of the Conference: In making my report for this committee I desire to preface my remarks by reading a motion which

Digitized by Google

created this committee. The motion was made reading "I make a motion that the Chair, or the president, appoint a committee of not less than three members of the Conference to draw up a constitution and set of bylaws for the guidance of this organization."

That motion was seconded, the question was taken, and the motion was agreed to.

This committee was appointed by the president, as required, and when we convened a certain question arose which necessitated my coming before the Conference yesterday and asking for a ruling by the Chair. In compliance with the mandate of the motion the committee therefore drew up these rules and regulations, or constitution, or whatever you want to call it. We are sorry that all of the committee could not see fit to sign the report, but we have done the best we could in compliance with the mandate of the motion which created the committee (reading):

PREAMBLE. Whereas the Constitution of the United States declares that Congress shall have power to fix standards of weights and measures, etc. (Section 8, Article 1), and

Whereas Congress has placed in the National Bureau of Standards the responsibility of the keeping of standards of weights and measures which are to be uniform throughout these United States and its several territories, and

Whereas the Director of the National Bureau of Standards did call a Conference of weights and measures officials of the several States of the Union in 1905 for the purpose of considering and adopting uniform weights and measures regulations, specifications, and tolerances, and

Whereas these Conferences have been continued since 1905, resulting in the adoption by the Conference and recommending by the National Bureau of Standards from time to time of reasonable uniform regulations, specifications, and tolerances for the guidance and use of officials of weights and measures of the several States of the Union, we assembled in this Twenty-sixth National Conference do hereby and herewith confirm the formation of this association and declare ourselves so constituted.

ARTICLE 1.

SECTION 1. The name of this association shall be the National Conference on Weights and Measures.

SECTION 2. *Purposes.*—The aims and purposes of this association shall be the consideration, adoption, and promotion of uniform regulations, specifications, and tolerances for all weighing and measuring devices used commercially in the United States and subdivisions thereof.

SECTION 3. *Membership.*—Any person employed by Federal, State, or subdivision thereof, engaged in the work pertaining to weights and measures shall be an "active member." Any person engaged in the manufacture, sale, or distribution of weights and measures and all weighing or measuring devices and/or in scientific research, and/or allied work, shall be "honorary members."

SECTION 4. *Officers.*—Officers of the conference shall consist of the following: A president, first vice president, second vice president, third vice president, fourth vice president, fifth vice president, a secretary, and a treasurer.

ARTICLE 2. *Elections.*

SECTION 1. By virtue of his office and the confidence reposed in him by the United States Congress, the Director of the National Bureau of Standards shall be the President of the Conference.

SECTION 2. All vice presidents shall be "active members" and elected by a majority vote as defined by article 4, sections 8 and 11.

SECTION 3. By virtue of his position and his close contact with the president, the Co-Chief of the Division of Weights and Measures of the National Bureau of Standards shall be the secretary.

SECTION 4. The treasurer shall be an active member and elected by a majority vote as defined in article 4, sections 8 and 11.

ARTICLE 3. *Duties.*

SECTION 1. The president shall preside over all meetings of the Conference and perform such acts as customarily pertain to the office.

SECTION 2. The vice presidents shall in order of their election perform the duties of the president in his absence.

Digitized by Google

SECTION 3. The secretary shall keep a record of all proceedings and actions of the Conference and perform such other duties as customarily pertain to the office.

SECTION 4. The treasurer shall receive all funds and disburse same as may be directed by the Conference.

ARTICLE 4.

SECTION 1. The general management of this Conference shall be vested in an executive committee consisting of the "line offices" and not more than one active member from each State. This committee shall recommend dates of meeting.

SECTION 2. The president and secretary of the Conference shall act as chairman and secretary of the executive committee.

SECTION 3. No person shall be assessed with dues. However, a voluntary registration fee may be contributed by each member in attendance to defray necessary expenses, such amount to be determined by the preceding Conference.

SECTION 4. A nominating committee consisting of nine active members shall be appointed at each annual meeting by the first vice president.

SECTION 5. A resolutions committee consisting of nine active members shall be appointed at each annual meeting by the second vice president.

SECTION 6. No member shall be appointed to or serve on more than one committee at the same time.

SECTION 7. There shall be a specifications and tolerances committee of which the Co-Chief of the Division of Weights and Measures of the National Bureau of Standards shall be permanent chairman and, in addition, six active members elected as other officers of the Conference, elected for a period as follows: Two for a period of 1 year, two for a period of 2 years, and two for a period of 3 years. At the expiration of each period successors shall be elected for a period of 3 years.

SECTION 8. The nominating committee shall present the name of one active member for each office or position as provided to be elected by a majority vote. Provided, however, that names of active members may be presented from the floor and elected in the same manner.

SECTION 9. The resolutions committee shall prepare and offer such resolutions as may be fitting or as may be directed by the Conference.

SECTION 10. The specifications and tolerances committee shall consider, prepare, and present for action by the Conference, regulations, specifications, and tolerances for weights and measures and/or weighing or measuring devices.

SECTION 11. The election of officers and report of the specifications and tolerances committee shall be determined by a majority roll call vote of the several States, each of which shall have three votes, active members only shall exercise privilege of voting.

SECTION 12. Every member of the Conference shall have the privilege of the floor.

SECTION 13. Report of the committee on specifications and tolerances or proposal relating thereto coming from the floor, shall be presented in writing allowing reasonable time for consideration prior to action of the Conference.

SECTION 14. Amendments to this constitution and bylaws shall be proposed in writing, signed by not less than 3 active members and reasonable time shall elapse prior to action of the Conference.

SECTION 15. Except as otherwise provided, Roberts Rules on Parliamentary Procedure, insofar as they are applicable to the Conference, shall apply.

SECTION 16. This constitution and bylaws shall be in full force and effect upon adoption by the Conference.

(Signed) C. D. BAUCOM, *Chairman*,
H. N. DAVIS,
S. T. GRIFFITH,
B. W. RAGLAND (by proxy),
Majority Members of Committee.

MINORITY REPORT PRESENTED BY JAMES O'KEEFE

Mr. Chairman and gentlemen of the Conference, I have no ulterior motive, I have no political aspirations so far as this Conference is concerned, in presenting this report, and anything that I might say is just general and what I believe and what the rest of the men who

Digitized by Google

signed this report believe, is the best thing for the Conference. In doing so I would like to go over some of the things in the majority report, if I may have that privilege.

Mr. GRIFFITH (interposing). The report is not under consideration. It can be brought on the floor by a proper motion. Let the minority report be presented as is in order.

The ACTING CHAIRMAN. I think that the proper thing would be to hear the minority report. I allowed the majority report to preface its remarks without limitation. However, the point has been called, and if the minority committee will just submit its report in relation to their attitude on the question we will appreciate it. Discussion may occur on the other related features when the motion comes up.

Mr. O'KEEFE. The reason I was going into this was because I wanted to give you the purpose for the minority report. However, so long as it is not under discussion I will go into that later.

THE ACTING CHAIRMAN. I allowed the majority to preface their report with certain explanatory remarks. I don't intend to deny you that privilege. I don't have in mind what particular question Mr. Griffith has in anticipation of what may be in the minority report.

Mr. GRIFFITH. I haven't any, because I didn't even have the opportunity of seeing it. I merely mention the fact that no discussion of any particular phases of the majority report should be had at this time. The minority report should be presented. If you want to make a statement as to the reasons for its presentation, all right, but don't attempt to argue on the points in the majority report, which is not under consideration.

Mr. O'KEEFE (reading):

The undersigned members of your Committee on Constitution and Bylaws have reviewed the history of former consideration by this organization of the question of the adoption of a constitution and bylaws. They have also given consideration to the progress made by the Conference up to the present without such instruments, its present flourishing condition, and the harmony existing in its membership. The above considerations have led them inevitably to the conclusion that a constitution and bylaws for this organization are not only unnecessary, but ill-advised. They accordingly report this conclusion to the membership and recommend that the Committee on Constitution and Bylaws, appointed in accordance with a motion adopted by the Twenty-fifth Conference, be discharged.

(Signed) JOHN P. MCBRIDE,
F. S. HOLBROOK,
JAMES O'KEEFE,
Minority Members of the Committee.

DISCUSSION OF ABOVE REPORT

Mr. O'KEEFE. Mr. Chairman, I offer that as a substitute for the original report, and I move its adoption.

(The motion was seconded.)

The ACTING CHAIRMAN. Is the body ready for action on the report of the Committee on Constitution and By Laws?

Mr. DAVIS. I rise to a point of personal privilege to state the reasons why I signed the majority report.

Mr. GRIFFITH. I think, Mr. Chairman, that now is the time for recognition of a question of personal privilege.

Mr. DAVIS. As a member of this committee I wish to state the reasons why I signed the majority report. It has been called to your

Digitized by Google

attention by Mr. Baucom that a draft was made for this body to adopt or reject. I think it is wholly within the province of this body, not within the province of the committee itself, to say to you whether there should be a constitution and bylaws or not. It is entirely up to you gentlemen, I think.

Mr. O'KEEFE. I believe the gentleman is right. It is up to you to vote on it. The committee thought we would be in a position to advise you in what we thought was the proper thing to do.

In the first place, this is not a legally constituted body. It is operating under no charter, and I do not know how you would have any right to make any bylaws. Some of the lawyers may know about that.

I am going to go over each question. I am going to be as brief as I can. The first question is, "The name of this Association shall be the National Conference on Weights and Measures." There isn't any charter, there isn't anything to show that there is such a body or organization at the present time outside of the name given to it by the National Bureau of Standards, which has called a committee meeting, as it were, each year.

Another thing, keep this in mind: This body might be all here this year. This body has changed from 25 to 50 percent from the personnel of last year, and the fact that they all belong to this organization today means nothing. A lot of us might lose our jobs tomorrow, and the organization wouldn't mean a thing.

SECTION 2. *Purposes.*—The aims and purposes of this association shall be the consideration, adoption, and promotion of uniform regulations, specifications and tolerances for all weighing and measuring devices used commercially in the United States and subdivisions thereof.

This organization, as I understand it, doesn't promote these specifications and tolerances. They come here and give their opinions as best they know how, to the Bureau of Standards.

SECTION 3. *Membership.*

I am not interested in that.

SECTION 4. *Officers.* Officers of the Conference shall consist of the following: A president, first vice president, second vice president, third vice president, fourth vice president, fifth vice president, a secretary, and a treasurer.

There are five vice presidents, but there doesn't seem to be much activity so far as those vice presidents are concerned.

ARTICLE 2. *Elections.*

SECTION 1. By virtue of his office and the confidence reposed in him by the United States Congress, the Director of the National Bureau of Standards shall be the President of the Conference.

That is only natural. That is a superfluous thing in there.

SECTION 2. All vice presidents shall be active members and elected by a majority vote as defined by article 4, sections 8 and 11.

I am not interested in that.

SECTION 3. By virtue of his position and his close contact with the president, the Co-Chief of the Division of Weights and Measures of the National Bureau of Standards shall be the secretary.

That is all right.

SECTION 4. The treasurer shall be an active member and elected by a majority vote as defined in article 4, sections 8 and 11.

Digitized by Google

You have that now. There is no necessity for a bylaw on that.

ARTICLE 3. *Duties.*

SECTION 1. The president shall preside over all meetings of the Conference and perform such acts as customarily pertain to the office.

That is all right.

SECTION 2. The vice presidents shall in the order of their election perform the duties of the president in his absence.

SECTION 3. The secretary shall keep a record of all proceedings and actions of the Conference and perform such other duties as customarily pertain to the office.

That is only the natural thing.

SECTION 4. The treasurer shall receive all funds and disburse same as may be directed by the Conference.

That doesn't mean anything. He doesn't collect very much to disburse.

ARTICLE 4.

SECTION 1. The general management of this Conference shall be vested in an executive committee consisting of the "line officers" and not more than one active member from each State. This committee shall recommend dates of meeting.

Well, they have to agree on that with the Bureau of Standards, because the Bureau of Standards should say when the meetings shall be. Our meeting should be held at times best suited to the Bureau.

SECTION 3. No person shall be assessed with dues. However, a voluntary registration fee may be contributed by each member in attendance to defray necessary expenses, such amount to be determined by the preceding Conference.

SECTION 4. A nominating committee, consisting of nine active members, shall be appointed at each annual meeting by the first vice president.

That is the first time in my life that I ever heard of a vice president appointing a nominating committee.

SECTION 5. A resolutions committee, consisting of nine active members, shall be appointed at each annual meeting by the second vice president.

That's something new, too.

SECTION 6. No member shall be appointed to serve on more than one committee at the same time.

That may be all wrong. We may have men here who would be good men to have on a nominating committee and who would be splendid men to have on a committee on specifications and tolerances. Why stop any man who is worth-while and who can do things from serving on two committees? You don't do it in a fraternal organization; you don't do it in any other places. That is class legislation.

SECTION 7. There shall be a specifications and tolerances committee, of which the Co-Chief of the Division of Weights and Measures of the National Bureau of Standards shall be permanent chairman and in addition six active members elected as other officers of the Conference, elected for a period as follows: Two for a period of 1 year, two for a period of 2 years, and two for a period of 3 years. At the expiration of each period successors shall be elected for a period of 3 years.

I don't believe there are more than 10 men who have been at this Conference for 3 years in a row. Maybe there are; I don't know. This personnel changes every year. You elect a man for 3 years as a member of this committee and he will probably be on some other job next year. Not only that, but how can you tell what he knows about tolerances? I couldn't tell you any more about proper toler-

Digitized by Google

ances than the man in the moon. The men you want on that kind of committee are men like "Cap" Griffith, or John McBride, or "Joe" Rogers—fellows who have had a lot of experience, years and years of experience. You get out here and just because some fellow is a good fellow on the job you elect him to the committee on specifications and tolerances and he will not know a thing about the subject. It is entirely out of line.

SECTION 8. The nominating committee shall present the name of one active member for each office or position as provided to be elected by a majority vote; provided, however, that names of active members may be presented from the floor and elected in the same manner.

SECTION 9. The resolutions committee shall prepare and offer such resolutions as may be fitting or as may be directed by the Conference.

They can do that anyhow. You don't need a bylaw for that.

SECTION 10. The specifications and tolerances committee shall consider, prepare, and present for action by the Conference regulations, specifications, and tolerances for weights and measures and/or weighing or measuring devices.

That's all right. It's just a recommendation.

SECTION 11. The election of officers and report of the specifications and tolerances committee shall be determined by a majority roll call vote of the several States, each of which shall have three votes. Active members only shall exercise the privilege of voting.

I would be in a fine fix, and so would John Levitt, coming from Illinois, if we had 10 men from Illinois representing different cities in that State. There are only two of us here now. Supposing we had brought seven other fellows down here and we said, "John Levitt has a vote, and you other six fellows are just here on a vacation."

I don't see why or how you should discriminate against anybody and have any man come into this Conference and say he can't have a vote in discussion. Supposing they do outvote you 14 to 3? You have their 14 minds against your 3, and my old Irish mother and father used to tell me that two heads were better than one. I don't know; maybe they were wrong. But if you have 10 or 20 or 50 minds saying anything, that is better than 1 or 2. Why say you can have only one or two? I wouldn't even go to such a Conference.

I can tell you another thing along that line. If a communication came to the city of Chicago saying that the National Weights and Measures Conference was going to have a meeting, and the meeting invitation was extended by Baucom, Griffith, and O'Keefe, I couldn't get the Mayor of Chicago to send me. But when a communication comes in on Government stationery signed by the National Bureau of Standards, the mayor says to me, "I want the city of Chicago represented there." I think that the Bureau of Standards will have a lot more weight in sending out invitations to have you men come here than any committee would.

SECTION. 13. The report of the committee on specifications and tolerances or proposals relating thereto coming from the floor, etc.

I guess that's fine.

SECTION 14. Amendments to this constitution and bylaws shall be proposed in writing, signed by not less than three active members, and reasonable time shall elapse prior to the action of the Conference.

Well, we can skip that. I don't believe in these bylaws.

SECTION 15. Except as otherwise provided, Robert's Rules on Parliamentary Procedure, insofar as they are applicable to the Conference, shall apply.

Digitized by Google

Robert's Rules are applicable to the chairman in enforcing the rules of procedure, and I think the chairman does that now; any change will be unnecessary.

That is my story. I still move the adoption of the minority report.

Mr. GRIFFITH. I didn't rise to a point of order, which should probably have been maintained against the reading of that report, because I presumed Mr. O'Keefe was using that as an argument for supporting his motion. I am very glad, however, that it was read again, so as to give those who did not hear it when it was first read another opportunity.

First of all, I would like to say that this is a very important question. It should receive the most careful consideration that the members of this Conference can give it. There isn't any doubt in my mind, from participating in Conferences since 1924 thereabouts, that there is need for some method of procedure. We proceed and perform remarkably well. I am surprised at Mr. O'Keefe, who, as I understood, said that only chartered bodies could have bylaws. The associations to which I belong, the Christian Endeavor and some little neighborhood clubs, always had a constitution and bylaws. It is a method of guidance for the operation of any deliberative body.

This report signed by the majority of the Constitution and Bylaws Committee is merely a recommendation. There may be, and probably are, a great many changes and additions that can be made to make it a more perfect document. However, personally I feel that I would be very disrespectful to this Conference in having been appointed as a member of the committee to do certain things, and I myself would have felt very derelict in my duty, if we had not drafted a constitution and set of bylaws. Whether you accept them or not is in your hands. The motion is as to whether we need them.

I can recite from memory in several Conferences moments of confusion and how they were settled I don't know. Last year, after a lapse of four years, the Conference convened and the membership was approximately 50 percent new members, unacquainted with how to do things in this Conference. Progress was slowly made, amidst a lot of discussion that was unnecessary.

Mr. O'Keefe is a member of this Conference. He attended it here for the first time last year. In other words, he is just a year and a half old. He is one of the signers of the minority report. Mr. Holbrook is our genesis and foundation and keystone. Mr. McBride is a man of proven merit and recognized ability as a vice president. They are the minority.

The majority report was signed by Baucom, a member of this Conference for some years and of some standing, and a State commissioner. Mr. Davis has been a member of this Conference for about 20 years. It was signed by Mr. Ragland, of Virginia, and by myself, a member for about 12 years. Certainly the experience that we have in recommending the need for plans of operation, rules, and regulations—a constitution and bylaws—is based on actual knowledge of the results that we have seen.

There is no attempt and, if there were, I would be the first to oppose it, to usurp any of the prerogatives, authority, or responsibility of the Bureau of Standards. Our sole aim in conferring here annually or from time to time is to arrive at uniformity of regulations,

Digitized by Google

specifications, and tolerances for weighing and measuring devices so that this great Union will not have a conglomeration of various codes affecting devices, handicapping a great manufacturing industry and exposing weights and measures officials in several jurisdictions if not to ridicule at least to little credence. The prime object is to secure, to consider, and to promote. I don't know why we can't promote. We may not do anything about it, but we certainly can promote a good idea or a good design for uniform regulation.

Naturally, in our work we have got to be dependent upon the National Bureau of Standards. In the provisions in the majority report, as read again by Mr. O'Keefe, an attempt has been made to keep the authority and the guidance in the hands of the National Bureau by naming as our permanent heads of the important and functioning activities those men who are in the National Bureau of Standards.

We all have ideas. In my State I think this is so and you, in your State, think that is so. I am quite sure you will all agree that if we could have regulations that were universal and general this Conference would have accomplished the duty which we are assembled to perform.

Mr. SWEENEY. Mr. Chairman and gentlemen, I have had the happy privilege of attending several meetings of the Annual Conference on Weights and Measures, beginning back as early as 1912, and I feel almost certain that any success that has marked the progress of this organization has been the result of its present construction. I hold no enmity and do not desire at this time to oppose the privilege and right of any man or any committee to present to this organization their viewpoint upon the construction and conduct of this organization. But, in view of the fact that we are in our construction a very peculiar organization, owing to the fact that we are far removed from our scene of operation, I feel that the ordinary procedure of a constitution can not be directly applied to obtain the best results.

Now, as Mr. O'Keefe said, I feel certain that my attendance at this Conference is due to the fact that annually the Mayor of Boston receives from the National Bureau of Standards a request that their director of weights and measures, Mr. Sweeney, represent the city. I feel certain of that because of the knowledge on the part of the Mayor of Boston and public men in general that the National Bureau of Standards is a universal organization performing wonderful and splendid work for the uplift of the people of the United States in general in all scientific branches and, because of that realization, the fact is brought out and it is driven home that it is essential that the city of Boston be represented.

I therefore, Mr. Chairman, sincerely hope and trust that the majority report will not prevail.

Mr. GRIFFITH. May I ask the secretary a question?

I think the reply will be enlightening. Do the invitations to this Conference come from the Director of the National Bureau of Standards?

Mr. HOLBROOK. State invitations, letters to Governors, and so forth, ordinarily go out signed by Dr. Briggs as Director of the National

Digitized by Google

Bureau of Standards and President of the National Conference on Weights and Measures. Other invitations go forward on Bureau of Standards stationery signed by me as secretary of the Conference.

While I am on the floor I might make a statement, inasmuch as I have signed this minority report. I have been connected with this Conference for some 26 years. Looking back over those 26 years I envision a very friendly and useful organization which has had a tremendous effect for good in relation to weights and measures in this country. I have never seen a situation arise where a formal constitution and bylaws would have been of any help in the Conference.

On the other hand, I have seen attempts made by this organization to adopt a constitution and bylaws. Ill feelings and animosities have been caused by the attempts to adopt such documents. At one time this Conference was well nigh disrupted by the dissatisfaction of one group after a constitution and bylaws had actually been adopted. That was in 1911. A constitution and bylaws was adopted. So many men came to the then Director of the Bureau of Standards, Dr. S. W. Stratton, that he personally, from the Chair, asked that some man who had voted for the adoption of the instrument move for its reconsideration. When its reconsideration was granted he strongly advised that the constitution be rescinded, and that action was taken. At the following Conference a great deal of valuable time was spent in debating the new instrument. A majority and minority report were filed, as in this case, and it ended by the proposed constitution and bylaws being laid upon the table.

At a Conference a few years ago, perhaps the Twenty-first Conference, a committee appointed for the purpose of drafting a constitution and bylaws brought in a report that in their opinion no constitution and bylaws were necessary. As I recall it, Mr. Griffith was a member of that committee, and, if I am not in error, made the motion that the resolution that no constitution and bylaws were necessary, be adopted.

We feel that the more informal this organization is the better the organization is going to be. We feel that the more you hamper this organization by restrictive rules and regulations the more politics you are going to bring into it. I do not mean Republican and Democratic politics, but I mean the formation of cliques and of groups who desire to put something across at the meetings.

As I see the instrument, State caucuses must be provided for. I think that caucuses in a meeting of this character, where a number of thoughtful men assemble for the purpose of gaining information that will be of value to them in their official duties, are entirely out of place.

From my experience of 25 or 26 years with this organization, I strongly recommend that the organization be kept as informal as possible. To this end I think the Conference should go on record that it is not necessary to govern itself with a constitution and bylaws.

Mr. GRIFFITH. You did not answer me completely. You mentioned that I was chairman of the committee at what date?

Mr. HOLBROOK. I do not think that I said you were chairman. I think I said you were a member. I referred to the Twenty-first Conference on Weights and Measures, held in 1928, when a report of the

Digitized by Google

special committee on constitution and bylaws was introduced. The concluding paragraph reads:

"In view of these considerations we find no constitution and bylaws which will be conducive to the best interests of the Conference, and recommend that the Conference continue as it is now operating. Further, we are of the opinion that the committee can not be of benefit to the Conference in any other report, and request you to dismiss the committee."

The report is signed by J. Harry Foley, chairman; H. L. Flurry, S. T. Griffith, William F. Cluett, as the Committee on Constitution and Bylaws, and Mr. Griffith's remark is, "Mr. Chairman, I move that the report of the committee be approved and adopted."

Mr. GRIFFITH. I really want to call attention to the membership of that committee—Mr. Foley, a State commissioner of long standing; Mr. Cluett, a member of long standing, and the other gentlemen. I was the baby. In other words, I was the goat, and was influenced by their activities. It was lack of knowledge—knowledge that I have obtained in these 12 years—that caused me to make that motion.

Mr. O'KEEFE. I rise to a point of order and say that if anyone says I am making this motion at the suggestion or advice of anybody else—

Mr. GRIFFITH. I did not.

Mr. ROGERS. Mr. Chairman and members of the Conference, Captain Griffith makes certain references to length of time he has been coming down here. I don't think that has any relationship to the question at all; however, I have been coming here for 18 years.

The captain pointed out that there have been times when there have been situations where the present procedure did not provide means for dealing with problems arising. I would like the captain to cite one specific instance, in the 18 years I have been here, where the Chair was not able to deal with any question of parliamentary procedure that has been brought up. Possibly he may have said that in a general way. There may have been times when a question of parliamentary procedure has arisen. That is perfectly all right.

I think that, after all, the trouble here is that there is no clarification in the minds of some of the men proposing this, as to the relationship between the National Bureau of Standards and this Conference. We have considered in New Jersey, in all the years that we have been coming down here, that we were the guests of the United States Government. We came here at their invitation. They could, if they cared to, just assume a "take it or leave it" attitude. They could say, "We are going to hold a Conference for the betterment of weights and measures of the United States and we invite the various representatives of the States to attend." They could leave it up to you to attend or not, and when you came here the Director of the Bureau of Standards could say, "I am the chairman." He could appoint a secretary. He would receive our recommendations and any proposals we might have to make.

He did not have to pay us, and the Bureau did not have to pay us, the compliment of setting up what might be termed an organization. I have never viewed this as an organization. It hasn't the title of an organization, it hasn't the title of an association. It just has the title of a Conference, and I think it should stay like that. I think it was just the courtesy of the National Bureau of Standards

Digitized by Google

that enabled States to come here to have this little recognition that can be granted—to receive recognition as vice presidents or as members of committees.

I must take issue with Captain Griffith on another point that he raised. He speaks of keeping the authority in the Bureau of Standards under the terms of this proposed constitution and bylaws. Gentlemen, to my mind, it is nothing but a rank usurpation of the prerogatives of the Bureau. Under this, as I see it, you make the Director of the Bureau of Standards a figurehead. You take from him the appointment of all committees. You put the appointment of committees in the hands of vice presidents and, as John O'Keefe, from Chicago, aptly said, he has never recalled in his association with organizations an instance where any vice president was ever empowered to appoint committees. I never heard of anything like that.

I think these things in the way of prerogatives as to the best conduct of these meetings should be left entirely in the hands of the Bureau of Standards. I consider myself the guest of the Bureau of Standards when I come down here and I feel myself in the same relative position as if I went into the home of a person who had invited me, whether to a feast or for a friendly talk. If I tried to usurp any of his prerogatives or violate any of my responsibilities as a guest, I would certainly be out of place.

I resent the remark of Captain Griffith wherein he said he was made the goat when Harry Foley (God bless his kindly soul!) and Bill Cluett, of Chicago, were on the committee. I don't believe either of those men ever made any man a goat. They believed that every man could think for himself. They were good analysts. No one has ever accused Captain Griffith of not being able to think for himself. He seems to have clarity of thought.

I am opposed to this myself, and I believe the Jersey delegation is opposed to it. I do not think there is any necessity for it.

Mr. GRIFFITH. I don't want Mr. Rogers to sit down with any idea that I offered any slight to Mr. Foley, whom I treasure in my mind as one of my very good friends, or to Mr. Cluett, of Chicago, who was a most venerable and kindly gentleman, but I merely mentioned the fact that I was young and inexperienced. I didn't know as much as I do now.

The ACTING CHAIRMAN. The question is your action on the motion to adopt the minority report. Those in favor signify by saying "Aye", [after a pause] opposed "No." The Chair declares that the report of the minority of the committee has been accepted.

Dr. BRIGGS. Members of the Conference, in view of the fact that I have to leave early in the morning and that there are a good many matters that I have to attend to this afternoon, I regret very much that I shall not be able to be present with you in this final afternoon session. I simply wanted to take this opportunity to say to you how deeply we appreciate your coming here, how satisfactory the meeting has been, and that we are looking forward to seeing you all, and many more of your friends, next year. Thank you.

(At this point, at 1:38 p. m., the Conference took a recess until 2:30 p. m.)

Digitized by Google

EIGHTH SESSION—AFTERNOON OF FRIDAY, JUNE 12, 1936

(The Conference reassembled at 2:35 p. m., at the Washington Hotel, Mr. John P. McBride, first vice president of the Conference, in the chair.)

The ACTING CHAIRMAN. Now gentlemen, we are ready for the afternoon session. The first item is the report of the secretary of the Conference, which will be presented by Mr. Holbrook.

Mr. HOLBROOK. The report of the secretary was intended to develop the consensus of the members on several points upon which information was desired. To save time this afternoon, I think that we will submit a letter ballot to all the members in attendance and allow them to answer the questions at their leisure. In this way we will obtain a much more representative vote.

CITATION BY OFFICIALS OF IMPORTANT COURT DECISIONS IN THEIR JURISDICTIONS

Mr. HOLBROOK. Mr. Chairman, I have one thing under this program item, submitted by wire, signed by R. E. Meek and addressed to Martin L. Lang:

Indiana Supreme Court yesterday (June 9) upheld decision St. Joseph County Superior Court and ordered Inspector Charles Burns reinstated and back salary paid. This was first Supreme Court test of constitutionality of 1925 act. Thought you might wish to report this decision to Conference under heading important court decisions.*

REPORT OF COMMITTEE ON NOMINATIONS, AND ELECTION OF OFFICERS

The ACTING CHAIRMAN. Is the Committee on Nominations ready to report?

Mr. LEVITT. The secretary of the committee will make the report.

Mr. BOYLE. Mr. Chairman, as secretary of the committee, I make the following report:

For president, Lyman J. Briggs; vice presidents, John P. McBride, John J. Levitt, C. D. Baucom, C. J. P. Cullen; secretary, F. S. Holbrook; treasurer, George F. Austin, Jr.

For members of the Executive Committee, Martin L. Lang, John W. Bates, William A. Jones, Edward K. Strobridge, Howard E. Crawford, H. N. Davis, W. S. Bussey, J. B. Fink, George E. Roberts, Russell S. Ackerman, Edward R. Fisher, S. T. Griffith, James O'Keefe, B. W. Ragland, C. J. Reynolds, Louis G. Waldman, George Warner, Walter G. White, S. H. Wilson, Seth L. Lightfoot, C. L. Jarrett, J. M. Daniels.

(Signed) JOHN J. LEVITT, *Chairman*,
MARTIN L. LANG,
HARRY S. PROVOST,
S. H. WILSON,
JAMES A. BOYLE,
S. T. GRIFFITH,
LOUIS G. WALDMAN,
Committee on Nominations.

*SECRETARY'S NOTE.—Further details of this decision are as follows: Mr. Burns is city inspector of weights and measures of South Bend, Ind. The mayor, contending that the 1933 governmental reorganization act gave him the power to remove Mr. Burns as city inspector, dismissed him in January 1935. The decision of the court upheld the 1925 weights and measures act, which provides charges must be preferred against a county or city inspector before he can be removed. These charges must be sustained, before removal, in a hearing before local authorities and by the State commissioner of weights and measures. As a final recourse the inspector can carry his appeal to the circuit or superior court of the county in which he resides.

Digitized by Google

I move, Mr. Chairman, that that report be accepted.

Mr. WHITE. I second the motion.

The ACTING CHAIRMAN. It is moved and seconded that the report of the Committee on Nominations be accepted as read by the committee. Is there any discussion on the motion?

Mr. HARRISON. To clarify the matter, I call the attention of the Chair to the fact that ordinarily the president, secretary, and vice presidents are members of the Executive Committee. I believe they should be so included.

Mr. BOYLE. Mr. Chairman, that point was mentioned and it was said that it was not necessary to have them included in the list, as they were automatically on the Executive Committee by virtue of being president, vice presidents, and secretary.

The ACTING CHAIRMAN. Is it the intention of the Nominating Committee to include those officers, Mr. Boyle?

Mr. BOYLE. Yes; it is the intention, Mr. Chairman.

The ACTING CHAIRMAN. Then your report will be that you submit these names and include on your Executive Committee the president, vice presidents, and secretary as members of the Executive Committee. That is the sense of the motion.

(It was moved and seconded that the nominations be closed, and that the secretary be directed to cast the ballot of the Conference for the officers and members of the executive committee, as nominated, the question was taken, and the motion was agreed to.)

(Accordingly the secretary cast the ballot of the Conference for the officers and members of the executive committee, as nominated by the Committee on Nominations, and they were declared duly elected.)

REPORT OF COMMITTEE ON RESOLUTIONS, PRESENTED BY WALTER G. WHITE, CHAIRMAN, AND DISCUSSION THEREON

Your Committee on Resolutions presents the following resolutions for your consideration:

RESEARCH ON AIR ELIMINATORS

Whereas from experience it has been shown that in the use of meters in the dispensing of petroleum products, both of the wholesale and retail types, the factor of air is the cause of serious inaccuracies in the use of same: Therefore be it

Resolved, That the National Bureau of Standards be requested to conduct a research into the use of air eliminators, with meters of the wholesale and retail types, and report the result of their findings at the next meeting of this Conference.

(The resolution as presented by the committee was duly adopted.)

Mr. WHITE (reading):

MEANS FOR CALIBRATION OF METERS USED AS STANDARDS

Whereas many States have adopted the use of meters for the purpose of calibrating vehicle tank compartments and many other States are considering this method of calibration; and

Whereas at the present time no provisions are made for the calibration of this type of meter by the National Bureau of Standards: Therefore be it

Resolved, That the Bureau of Standards be requested to provide suitable means for the proper calibration of meters designed for the use of petroleum products and that a suitable testing medium be used.

Mr. ROGERS. Isn't that already covered in our specifications? We prescribe methods of test and tolerances and variations for meters.

95684—36——12

Digitized by Google

Mr. WHITE. We, in that resolution, are asking the National Bureau of Standards to make provision for the calibration of our test meters. At the present time they use water for that purpose and it is not advisable to use water as a testing medium in a meter used on petroleum products.

Mr. ROGERS. Is it necessary to saddle the Bureau of Standards with that responsibility? You have the facilities to make it possible in your own State to calibrate your own meter. Standards are available to make such calibration possible. I am not adverse to this. It is perfectly all right with me if we adopt meters as a calibrating unit to have the Bureau calibrate them, but whether it would be absolutely necessary to have it done by the Bureau is a question.

Mr. HOLBROOK. I think Mr. White misspoke himself or was not entirely familiar with our practice. The Bureau has never used water in the testing of gasoline meters, nor would we do so. The Bureau uses water in connection with the testing of some large-capacity meters, but they are for the purpose of measuring beer. If we test large-capacity meters for the States, for use with gasoline, we will use gasoline or some substance which will be of approximately the same viscosity as gasoline.

If there is a demand for the test of standard meters the Bureau of Standards will try to meet that demand, so I think that the resolution is entirely in order and the Bureau will see what it can do in this connection.

(The resolution as presented by the committee was duly adopted.)

SPECIFICATION FOR MANIFOLDING SYSTEMS ON VEHICLE TANKS

Mr. WHITE (reading):

Whereas during the present Conference it has been brought out that under certain circumstances the manifold system of vehicle tanks is not satisfactory: Therefore be it

Resolved, That the Committee on Specifications and Tolerances of this Conference give this question consideration and make recommendations to the next Conference.

(The resolution as presented by the committee was duly adopted.)

APPRECIATION TO HEADQUARTERS HOTEL AND TO EXHIBITORS

Mr. WHITE (reading):

Resolved, That the Twenty-sixth National Conference on Weights and Measures express its warmest appreciation and thanks to the Washington Hotel for its careful provision for our comfort, and to the several exhibitors for their educational and instructive displays.

(The resolution as presented by the committee was duly adopted.)

APPRECIATION TO THE PRESS AND TO THE SCALE JOURNAL

Mr. WHITE (reading):

Resolved, That an individual expression of appreciation be sent by the secretary to the press of Washington and to the Scale Journal for the generous and eminently satisfactory way in which these papers have reported the Twenty-sixth National Conference on Weights and Measures.

(The resolution as presented by the committee was duly adopted.)

Digitized by Google

APPRECIATION TO MR. R. J. TRUMP

Mr. WHITE (reading):

Whereas Mr. R. J. Trump, Controller, Standards Department, Board of Trade of England, prepared and submitted to this Conference a scholarly paper on the administration of weights and measures in Great Britain: Therefore be it

Resolved, That we, the Twenty-sixth National Conference on Weights and Measures in meeting assembled in Washington, D. C., do hereby express our deep appreciation; and be it further

Resolved, That the secretary of the Conference be instructed to forward a copy of this resolution to Mr. R. J. Trump.

(The resolution as presented by the committee was duly adopted.)

APPRECIATION TO EXHIBITORS OF EQUIPMENTS FOR THE TESTING OF LARGE-CAPACITY SCALES

Mr. WHITE (reading):

Whereas the Department of Weights and Measures of the State of New Jersey and the Department of Markets, Weights, and Measures of the city of New York sent to this Conference, at their own expense, their new testing equipment for large-capacity scales; and

Whereas by such action on their part much information was imparted to the delegates in attendance at the Conference: Therefore be it

Resolved, That we, the members of the Twenty-sixth National Conference on Weights and Measures, do hereby express to them our grateful appreciation.

(The resolution as presented by the committee was duly adopted.)

APPRECIATION TO COOPERATING OFFICIALS

Mr. WHITE (reading):

Whereas the Governors, county and city officials of the various States, counties, and cities, through their manifest interest in weights and measures work have made it possible by their cooperation for their jurisdictions to be represented at this, the Twenty-sixth National Conference on Weights and Measures held in the Nation's capital at Washington, and

Whereas such cooperation and attendance have made it possible to adopt uniform regulations for the various jurisdictions, and in other ways facilitate the improvement of Weights and Measures Departments: Therefore be it

Resolved, That a letter of appreciation, with a copy of this resolution, be forwarded to these various officials by the secretary of the Conference, thanking them for their cooperation.

(The resolution as presented by the committee was duly adopted.)

APPRECIATION TO DIRECTOR AND STAFF OF THE NATIONAL BUREAU OF STANDARDS

Mr. WHITE (reading):

Whereas Dr. Lyman J. Briggs, Mr. F. S. Holbrook, and Mr. Ralph Smith, and their able and efficient staff, have extended valuable assistance and guidance to this Conference: Therefore be it

Resolved, That this Conference go on record in sincere and grateful appreciation of their cooperation in making this Conference a success.

(The resolution as presented by the committee was duly adopted.)

APPRECIATION FOR RECEPTION TENDERED BY NORTH CAROLINA DELEGATION

Mr. WHITE (reading):

Resolved, That special thanks be tendered the North Carolina delegation for their cordial reception to the ladies attending the Conference.

(The resolution as presented by the committee was duly adopted.)

Digitized by Google

AUTHORIZATION OF A COMMITTEE ON PUBLICITY

Mr. WHITE (reading):

Whereas this Conference realizes the important relationship of proper publicity to the work of weights and measures, we believe it essential that this Conference have a permanent and duly authorized committee whose express duty would be to see that the news agencies are furnished with information of interest and importance in connection with our Annual Conference: Therefore be it

Resolved, That the President of this Conference be authorized to appoint a committee of not less than three members of the Conference to perform this important duty.

(The resolution as presented by the committee was duly adopted.)

APPROVAL OF MERIT SYSTEM OF APPOINTMENT OF OFFICIALS

Mr. WHITE (reading):

Whereas this Conference realizes the importance of continuity of service of weights and measures workers; Therefore be it

Resolved, That this, the Twenty-sixth National Conference on Weights and Measures go on record as approving the merit system for every position in the weights and measures service.

(The resolution as presented by the committee was duly adopted.)

IN MEMORY OF OUR DEPARTED MEMBERS

Mr. WHITE (reading):

Whereas during the past year we have lost through the plan of Divine Providence several members of this Conference; and

Whereas our associations with these gentlemen have been an inspiration in prompting us to go forward with a greater determination to carry on the ideals set by them: Therefore be it

Resolved, That we of the Twenty-sixth National Conference on Weights and Measures, in meeting assembled, do hereby draw up this resolution as an expression of our sincere sorrow at their passing.

Mr. GRIFFITH. Is it possible to get the names of those members?

Mr. WHITE. We were unable to procure the names. We will be glad to have this amended to include the names if they are available.

Mr. ROGERS. Might I propose as an amendment to that a rising vote, in silent testimonial?

Mr. FISHER. I would like to pay my respects to my former sealer, who passed on since the last Conference.

Mr. GRIFFITH. Probably the secretary will have more contact than anybody. I see from time to time in the Scale Journal some names, but I doubt if you can get them all. For those you can get I think it will be a graceful gesture to send the families a copy of this resolution.

Mr. BOOTH. In view of the practical impossibility of procuring all names, I feel it might be better to follow the suggestion of the gentleman from New Jersey that we stand in silence for, say, thirty seconds.

The ACTING CHAIRMAN. The amendments to the motion to adopt this resolution are that the secretary shall obtain the names of the departed members, and shall forward to the families of those deceased members a copy of this resolution; moreover, that the body shall rise for a moment of silence in tribute to the departed members.

(The resolution was adopted by the members rising and standing in silence for a time.)

Digitized by Google

Mr. WHITE. All resolutions submitted herein were unanimously approved by the committee.

(Signed) WALTER G. WHITE, New Hampshire, *Chairman*,
W. S. BUSSEY, Texas,
J. M. DANIELS, Michigan,
J. B. FINK, Washington,
C. P. SMITH, New York,
EDWARD K. STROBRIDGE, California,
JAMES A. SWEENEY, Massachusetts,
Committee on Resolutions.

Mr. O'KEEFE. I think the Committee on Resolutions did a splendid job, and I think they are entitled to a vote of thanks, because it took a lot of hours to get up those resolutions. I move you, therefore, that the Committee on Resolutions be extended a vote of thanks by this Conference.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. HARRISON. I have had the pleasure of attending a great many of these Conferences. One very hard-working committee in your Conference I have yet to see thanked. I would like to offer at this time some modicum of appreciation to the Committee on Specifications and Tolerances, who at the present Conference to my certain knowledge labored hard for 4 days prior to the Conference and practically every moment of their spare time evenings during the Conference, and have done a very, very wonderful job.

I offer that in the form of a motion.

(The motion was seconded, the question was taken, and the motion was agreed to.)

REPORT OF THE TREASURER, GEORGE F. AUSTIN, JR.

Receipts:			
Balance on hand June 1, 1935			$209.39
Dues from delegates			147.00
Interest received			6.50
Total receipts			362.89
Disbursements:			
June 1, 1935.	Receipt book (500 page)	$1.80	
June 15, 1935	Telephone calls	.40	
	Printing stickers	3.50	
	Messenger, mimeographing, and clerical service	25.00	
Total disbursements			30.70
Balance on hand June 1, 1936			332.19

(Signed) GEO. F. AUSTIN, Jr., *Treasurer.*

(The report was duly accepted.)

The ACTING CHAIRMAN. The next item is the selection of hotel headquarters for the Twenty-seventh National Conference.

Mr. STROBRIDGE. Most of us are from out of the city, and I would move you that the selection of hotel headquarters for our next Conference be left in the hands of the president and the secretary of the Conference.

Mr. BOOTH. I second the motion.

Digitized by Google

Mr. HOLBROOK. I would like to amend that motion to put it in the hands of the Executive Committee. We can get schedules of rates some time before the next Conference, and ask the Executive Committee to express its choice.

Mr. STROBRIDGE. I will accept that as the original motion.

Mr. BOOTH. I assent.

(The question was taken and the motion was agreed to.)

The ACTING CHAIRMAN. The next item is "Unfinished Business."

Mr. ROGERS. We often hear so much of the "forgotten man", and I think that sometimes there are forgotten women, too. In the conducting of this Conference there is a tremendous lot of clerical labor. I think some little token of material appreciation should be extended to these girls for this extra work.

Mr. SWEENEY. Well, Mr. President, I think it is a very good thought, and, considering the solvency of our treasury, I would respectfully move at this time that the secretary be empowered to spend from the very solvent treasury of the Conference the sum of $10 to take care of any appreciation that we want to show these girls.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. GRIFFITH. Last year we had several interesting discussions on the question of beer; barrels, I think, were particularly under discussion. Now, the method of dispensing beer has developed, and I think it might be of some interest to a great many of us to have a paper on that subject. It came to my attention this morning that a brewery in Baltimore is offering for sale a case of beer, called the family size, containing four half-gallon bottles. The usual twenty-four 12-ounce bottles in a case represents an amount sold to the consumer of 288 ounces, whereas these 4 half-gallon bottles give you only 256 ounces. There is a difference there of a considerable amount.

Anyhow, the development of the trade of handling beer I think might be of interest to us and might be included in the program.

The ACTING CHAIRMAN. These suggestions will be taken down by the reporter, and I believe no further action is necessary.

(A motion was made and seconded that the Conference adjourn, the question was taken, and the motion was agreed to.)

(Thereupon, at 3:15 p. m. the Twenty-sixth National Conference on Weights and Measures adjourned sine die.)

Digitized by Google

Digitized by Google

Digitized by Google

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

REPORT OF THE TWENTY-SEVENTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

ATTENDED BY REPRESENTATIVES
FROM VARIOUS STATES

HELD AT THE NATIONAL BUREAU OF STANDARDS
WASHINGTON, D. C., JUNE 1, 2, 3, AND 4, 1937

MISCELLANEOUS PUBLICATION M159

UNIVERSITY
LIBRARY
Digitized by Google

Digitized by Google



Official photograph of delegates and guests attending the Twenty-seventh National Conference on Weights and Measures, assembled at the entrance of the East Building, National Bureau of Standards.

Digitized by Google

U. S. DEPARTMENT OF COMMERCE
DANIEL C. ROPER, Secretary
NATIONAL BUREAU OF STANDARDS
LYMAN J. BRIGGS, Director

MISCELLANEOUS PUBLICATION M159

REPORT OF THE TWENTY-SEVENTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

ATTENDED BY REPRESENTATIVES
FROM VARIOUS STATES

HELD AT THE NATIONAL BUREAU OF STANDARDS
WASHINGTON, D. C., JUNE 1, 2, 3, AND 4, 1937

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1937

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - - - - - - - - - - Price 15 cents

Digitized by Google

ASTOR
X

Digitized by Google

OFFICERS AND COMMITTEES

OFFICERS

(Serving during Twenty-Seventh National Conference)

President, LYMAN J. BRIGGS, Director, National Bureau of Standards, Washington, D. C.
Vice Presidents:
C. D. BAUCOM, State Superintendent of Weights and Measures, Raleigh, N. C.
C. J. P. CULLEN, Director, State Bureau of Standard Weights and Measures, Harrisburg, Pa.
JOHN J. LEVITT, State Superintendent of Standards, Springfield, Ill.
JOHN P. MCBRIDE, Director, State Division of Standards, Boston, Mass.
Secretary, F. S. HOLBROOK, National Bureau of Standards, Washington, D. C.
Treasurer, GEORGE F. AUSTIN, JR., Supervising Inspector of Weights and Measures, Detroit, Mich.

(As elected by the Twenty-Seventh National Conference for the ensuing year)

President, LYMAN J. BRIGGS, Director, National Bureau of Standards, Washington, D. C.
Vice Presidents:
W. S. BUSSEY, Chief, State Division of Weights and Measures, Austin, Tex.
C. J. P. CULLEN, Director, State Bureau of Standard Weights and Measures, Harrisburg, Pa.
JOHN J. LEVITT, State Superintendent of Standards, Springfield, Ill.
ROLLIN E. MEEK, Chief, State Bureau of Weights and Measures, Indianapolis, Ind.
Secretary, F. S. HOLBROOK, National Bureau of Standards, Washington, D. C.
Treasurer, GEORGE F. AUSTIN, JR., Supervising Inspector of Weights and Measures, Detroit, Mich.

COMMITTEES

EXECUTIVE COMMITTEE

(As elected by Twenty-Seventh National Conference)

LYMAN J. BRIGGS
W. S. BUSSEY
C. J. P. CULLEN
JOHN J. LEVITT
ROLLIN E. MEEK
F. S. HOLBROOK
GEORGE F. AUSTIN, JR.
} *Ex officio.*

JAMES A. BOYLE, Sealer of Weights and Measures, Portland, Maine.
CHARLES H. BULSON, Sealer of Weights and Measures of Jefferson County, Theresa, N. Y.
HOWARD E. CRAWFORD, Inspector of Weights and Measures, Jacksonville, Fla.
H. N. DAVIS, Deputy State Commissioner of Weights and Measures, Montpelier, Vt.
S. T. GRIFFITH, Chief, Division of Weights and Measures, Baltimore, Md.
C. L. KLOCKER, State Inspector of Weights and Measures, Hartford, Conn.
JAMES O'KEEFE, Sealer of Weights and Measures, Chicago, Ill.
B. W. RAGLAND, Chief, Bureau of Weights and Measures, Richmond, Va.
CHARLES C. READ, State Superintendent of Weights and Measures, Trenton, N. J.
GEORGE M. ROBERTS, District Superintendent of Weights, Measures, and Markets, Washington, D. C.
K. K. SOLBERG, Supervisor, State Department of Weights and Measures, Minneapolis, Minn.

Digitized by Google

JAMES A. SWEENEY, Sealer of Weights and Measures, Boston, Mass.
C. E. TUCKER, Chief, State Division of Weights and Measures, Sacramento, Calif.
LOUIS G. WALDMAN, Commissioner of Weights and Measures, St. Louis, Mo.
GEORGE WARNER, Chief State Inspector of Weights and Measures, Madison, Wis.
S. H. WILSON, State Oil Chemist, Atlanta, Ga.
WILLIAM C. WITFOTH, Sealer of Weights and Measures, Toledo, Ohio.

COMMITTEE ON SPECIFICATIONS AND TOLERANCES

(Standing committee)

F. S. HOLBROOK, National Bureau of Standards, Washington, D. C., chairman.
CHARLES M. FULLER, Sealer of Weights and Measures of Los Angeles County, Los Angeles, Calif.
JOSEPH G. ROGERS, Assistant State Superintendent of Weights and Measures, Trenton, N. J.
JOHN P. MCBRIDE, Director, State Division of Standards, Boston, Mass.
GEORGE F. AUSTIN, Jr., Supervising Inspector of Weights and Measures, Detroit, Mich.

COMMITTEE ON PUBLICITY

(Standing committee)

GEORGE M. ROBERTS, District Superintendent of Weights, Measures, and Markets, Washington, D. C., chairman.
GLENN L. BERRY, Superintendent of Weights and Measures of Monmouth County, Asbury Park, N. J.
W. S. BUSSEY, Chief, State Division of Weights and Measures, Austin, Tex.
C. L. KLOCKER, State Inspector of Weights and Measures, Hartford, Conn.
LOUIS G. WALDMAN, Commissioner of Weights and Measures, St. Louis, Mo.

ACTING COMMITTEES FOR THE TWENTY-SEVENTH NATIONAL CONFERENCE

Committee on Nominations. JOHN P. MCBRIDE, of Massachusetts, chairman; O. E. BRENNEMAN, of Ohio; C. H. BULSON, of Jefferson County, N. Y.; H. N. DAVIS, of Vermont; B. W. RAGLAND, of Richmond, Va.; C. B. TOLAN, of Fort Wayne, Ind.; and C. E. TUCKER, of California.

Committee on Resolutions. C. J. P. CULLEN, of Pennsylvania, chairman; L. J. ALLEN, of Seattle, Wash.; C. D. BAUCOM, of North Carolina; WILLIAM H. ISING, Jr., of Louisville, Ky.; JOHN J. LEVITT, of Illinois; CHARLES C. READ, of New Jersey; and ARTHUR J. WILHELM, of Hamtramck, Mich.

In Charge of Exhibits. BERNARD RICE.

In Charge of Registrations. MRS. H. E. ROSENBERGER.

Digitized by Google

PERSONS ATTENDING THE CONFERENCE

DELEGATES—STATE, CITY, AND COUNTY OFFICIALS

ALABAMA

State	H. S. Holloway, Chief, Division of Weights and Measures, Montgomery.
City: Birmingham	R. M. Johnson, Chief Inspector of Weights and Measures, City Hall.

CALIFORNIA

State	C. E. Tucker, Chief, Division of Weights and Measures, Sacramento.
County: Los Angeles	Charles M. Fuller, Sealer of Weights and Measures, 501 New High Street, Los Angeles.

CONNECTICUT

State	Walter F. Stiles, Captain, Department of State Police, 100 Washington Street, Hartford. C. L. Klocker, Inspector of Weights and Measures, 100 Washington Street, Hartford. Thomas F. Rice, Department of State Police, Municipal Building, Hartford.
City: Bridgeport	Louis Snow, Sealer of Weights and Measures, 925 Main Street.
County: Hartford	Walter R. Falk, Sealer of Weights and Measures, City Hall, New Britain.

DISTRICT OF COLUMBIA

District	George M. Roberts, Superintendent of Weights, Measures, and Markets, 467 C Street, Washington.

FLORIDA

City: Jacksonville	Howard E. Crawford, Inspector of Weights and Measures, Utilities Building.

GEORGIA

State	S. H. Wilson, State Oil Chemist, State Capitol, Atlanta.
City: Atlanta	W. P. Reed, Inspector of Weights and Measures, Police Headquarters.

IDAHO

State	Frank L. Hammon, Director, Bureau of Weights and Measures, State House, Boise.

ILLINOIS

State	John J. Levitt, Superintendent of Standards, Capitol Building, Springfield.
City: Chicago	James O'Keefe, Sealer of Weights and Measures, City Hall.

Digitized by Google

INDIANA

State	ROLLIN E. MEEK, Chief, Bureau of Weights and Measures, State House Annex, Indianapolis.
City:	
Fort Wayne	C. B. TOLAN, Inspector of Weights and Measures, City Hall.
Gary	CLEO C. MORGAN, Sealer of Weights and Measures, City Hall.
Terre Haute	A. EDWARD SNYDER, Inspector of Weights and Measures, City Hall.
City and County: Huntington, and Huntington County.	DEFOREST MCLIN, Inspector of Weights and Measures, Huntington.

KENTUCKY

City: Louisville	WILLIAM H. ISING, JR., Inspector of Weights and Measures, City Hall.

MAINE

State	G. K. HEATH, Deputy Sealer of Weights and Measures, Augusta.
City:	
Portland	JAMES A. BOYLE, Sealer of Weights and Measures, City Building.
Skowhegan	JOSEPH H. MURRAY, Sealer of Weights and Measures.
Waterville	WILLIAM A. JONES, Sealer of Weights and Measures, City Hall.

MARYLAND

City: Baltimore	S. T. GRIFFITH,[1] Chief, Division of Weights and Measures, Municipal Building. CHARLES G. CROCKETT, Inspector of Weights and Measures, Municipal Building. JOHN R. GRAEFF, Inspector of Weights and Measures, Municipal Building. GEORGE H. LEITHAUSER, Inspector of Weights and Measures, Municipal Building. THOMAS J. NAPFEL, Inspector of Weights and Measures, Municipal Building. ELMER E. NICHOLSON, Inspector of Weights and Measures, Municipal Building. ELMER S. PIERPONT, Inspector of Weights and Measures, Municipal Building. HENRY J. SLITZER, Assistant Inspector of Weights and Measures, Municipal Building.

MASSACHUSETTS

State	JOHN P. MCBRIDE, Director of Standards, State House, Boston. JAMES J. DAWSON, Inspector of Standards, State House, Boston. LORENZO D. F. MARSTON, Inspector of Standards, State House, Boston.
City:	
Arlington	ALLEN E. COWIE, Sealer of Weights and Measures, Town Hall.
Boston	JAMES A. SWEENEY, Sealer of Weights and Measures, City Hall Annex.
Springfield	WILLIAM FOSTER, Sealer of Weights and Measures, City Hall.
Taunton	EDWARD C. WARD, Sealer of Weights and Measures.

[1] Designated by the Governor to represent the State.

Digitized by Google

MICHIGAN

City:	
Detroit	GEORGE F. AUSTIN, JR., Supervising Inspector of Weights and Measures, 1300 Beaubien Street.
Hamtramck	ARTHUR J. WILHELM, Sealer of Weights and Measures, 2444 Andrus Street.
Lansing	CHARLES T. QUINN, Sealer of Weights and Measures, City Market.
Royal Oak	GEORGE E. RUTLIDGE, Sealer of Weights and Measures, 221 East Third Street.

MINNESOTA

State	K. K. SOLBERG, Supervisor, Department of Scales, Weights, and Measures, 216 Corn Exchange, Minneapolis.
City: Minneapolis	RUSSELL S. ACKERMAN, Superintendent, Department of Licenses, Weights, and Measures, City Hall.

MISSOURI

City: St. Louis	LOUIS G. WALDMAN,[3] Commissioner of Weights and Measures, City Hall.

NEVADA

State	JOE M. MCLEOD, Inspector of Weights and Measures, Fifth and Sierra Streets, Reno.

NEW JERSEY

State	CHARLES C. READ, Superintendent of Weights and Measures, 187 West Hanover Street, Trenton.
	HARRY A. WALSH, Assistant Attorney General, State House, Trenton.
	JOSEPH G. ROGERS, Assistant Superintendent of Weights and Measures, 187 West Hanover Street, Trenton.
	R. K. BODENWIESER, Assistant Superintendent of Weights and Measures, 187 West Hanover Street, Trenton.
	ELLIOTT B. HOLTON, Assistant Superintendent of Weights and Measures, 187 West Hanover Street, Trenton.
	HARRY S. PROVOST, Assistant Superintendent of Weights and Measures, 187 West Hanover Street, Trenton.
	ARCHIE T. SMITH, Inspector of Weights and Measures, 187 West Hanover Street, Trenton.
City:	
Bayonne	WALTER J. FLYNN, Superintendent of Weights and Measures, Municipal Building.
Elizabeth	WILLIAM J. BENDER, Superintendent of Weights and Measures, City Hall.
Englewood	LEONARD DERIENZO, Superintendent of Weights and Measures, Municipal Building.
Jersey City	JOHN S. BURKE, Superintendent of Weights and Measures, City Hall.
Linden	CORNELIUS O'DONNELL, Superintendent of Weights and Measures, City Hall.
Paterson	JOSEPH P. LEONARD, Superintendent of Weights and Measures, 115 Van Houten Street.
Perth Amboy	JOHN FARKAS, JR., Superintendent of Weights and Measures.
Trenton	FRANCIS J. BLACK, Superintendent of Weights and Measures, 29 West Hanover Street.
Union City	ALFRED O. OSLUND, Superintendent of Weights and Measures, City Hall.

[3] Designated by the Governor to represent the State.

Digitized by Google

County:	
Bergen	A. F. BARNARD, Superintendent of Weights and Measures, Administrative Building, Hackensack.
Burlington	CURWEN B. FISHER, Superintendent of Weights and Measures, Mount Holly.
Cape May	GILBERT S. SMITH, Superintendent of Weights and Measures, Avalon.
Essex	CHARLES R. SMITH, Assistant Superintendent of Weights and Measures, Hall of Record, Newark.
Hudson	THOMAS J. WALDRON, Superintendent of Weights and Measures, County Court House, Jersey City.
Mercer	RALPH BODENWEISER, Superintendent of Weights and Measures, Court House, Trenton.
Middlesex	CHARLES H. ENGELHARD, Superintendent of Weights and Measures, County Record Building, New Brunswick.
Monmouth	GLENN L. BERRY, Superintendent of Weights and Measures, 706 Eighth Avenue, Asbury Park.
Morris	CHARLES S. WANDLING, Superintendent of Weights and Measures, Court House, Morristown.
Passaic	WILLIAM MILLER, Superintendent of Weights and Measures, Court House, Paterson.
Somerset	O. B. MATHEWS, Superintendent of Weights and Measures, Court House, Somerville.
Sussex	R. L. SLATER, Superintendent of Weights and Measures, Newton.
Warren	W. ARMSTRONG MACKEY, Superintendent of Weights and Measures, Belvidere.

NEW YORK

City:	
New York	ALEX PISCIOTTA, Deputy Commissioner, Department of Public Markets, Weights, and Measures, 139 Centre Street.
	MATTHIAS A. HARRINGTON, Chief Supervisor, Department of Public Markets, Weights, and Measures, 139 Centre Street.
Poughkeepsie	LOUIS J. HOFFMAN, Sealer of Weights and Measures.
Rochester	ANTHONY C. SAMENFINK, Sealer of Weights and Measures, 34 Court Street.
White Plains	RICHARD HARDING, Sealer of Weights and Measures, 19 Waldo Avenue.
County:	
Jefferson	CHARLES H. BULSON, Sealer of Weights and Measures, 8 Park Avenue, Theresa.
Nassau	ROBERT WILLIAMS, Sealer of Weights and Measures, Court House Annex, Mineola.
	WILLIAM KIRK, JR., Deputy Sealer of Weights and Measures, 518 Sheridan Boulevard, Inwood, L. I.
Suffolk	C. P. SMITH, Sealer of Weights and Measures, P. O. Box 412, East Moriches.
Warren	L. J. DEAN, Sealer of Weights and Measures, 62 Elm Street, Glens Falls.

NORTH CAROLINA

State	C. D. BAUCOM, Superintendent of Weights and Measures, Raleigh.
	H. W. HOOD, Inspector of Weights and Measures, Raleigh.
	GEORGE S. TURNER, Inspector of Weights and Measures, Raleigh.

Digitized by Google

City:	
Raleigh	G. R. STALLINGS, Inspector of Weights and Measures, City Hall.
Winston-Salem	B. K. JONES, Inspector of Weights and Measures, City Hall.
City and County: Charlotte, and Mecklenburg County.	F. C. YARBROUGH, Inspector of Weights and Measures, 300 South Poplar Street, Charlotte.

NORTH DAKOTA

State	A. J. JENSEN, Superintendent of Weights and Measures, Jamestown.
	ROY JENSEN, Deputy Superintendent of Weights and Measures, Jamestown.

OHIO

State	O. E. BRENNEMAN, Chief, Bureau of Weights and Measures, State Office Building, Columbus.
	J. C. TINKEY, Deputy State Sealer, State Office Building, Columbus.
City: Toledo	WILLIAM C. WITFOTH, Sealer of Weights and Measures, 555 Erie Street.
County: Columbiana	CHARLES CANNELL, Deputy Sealer of Weights and Measures, East Palestine.

PENNSYLVANIA

State	C. J. P. CULLEN, Director, Bureau of Standard Weights and Measures, Harrisburg.
	WILLIAM A. HAGAN, Supervisor, Bureau of Standard Weights and Measures, 1843 McKean Street, Philadelphia.
	W. E. MOODY, Deputy Inspector of Weights and Measures, Chestnut Ridge.
City:	
Allentown	JAMES E. MCHUGH, Sealer of Weights and Measures, City Hall.
Harrisburg	GEORGE B. NEBINGER, Inspector of Weights and Measures, P. O. Box 207.
Pittsburgh	H. C. PATTON, Superintendent, Weights, Measures, and Food Inspection, City and County Building.
Reading	WILLIAM A. HIGH, Inspector of Weights and Measures, City Hall.
York	IRVIN R. SHULTZ, Inspector of Weights and Measures, City Hall.
County:	
Allegheny	PATRICK J. HUNTER, Inspector of Weights and Measures, Court House, Pittsburgh.
Bradford	R. L. BLOCHER, Sealer of Weights and Measures, Wyalusing.
Clarion and Forest	JAMES B. CARLOS, Sealer of Weights and Measures, Clarion.
Franklin	ROY G. KELL, Sealer of Weights and Measures, 358 East Catharine Street, Chambersburg.
Union	HOBERT R. SPAID, Sealer of Weights and Measures, Mifflinburg.

RHODE ISLAND

State	EDWARD R. FISHER, Chief, Bureau of Weights and Measures, State House, Providence.
City: West Warwick	SANTO G. SACCHETTI, Sealer of Weights and Measures, Town Hall.

Digitized by Google

SOUTH CAROLINA

State	A. H. GIBERT, Chief Inspector, Department of Agriculture, Commerce, and Industries, Columbia.

TENNESSEE

City: Nashville	TOM WEBB, Sealer of Weights and Measures, City Hall.

TEXAS

State	W. S. BUSSEY, Chief, Division of Weights and Measures, Austin. O. A. KIRKLAND, Inspector of Weights and Measures, Dallas.
City:	
Dallas	R. L. FULLEN, Sealer of Weights and Measures, City Hall.
San Antonio	JOHN C. SPEIER, Sealer of Weights and Measures, City Hall.

VERMONT

State	H. N. DAVIS, Deputy Commissioner of Weights and Measures, Montpelier.

VIRGINIA

State	J. H. MEEK, Director, Division of Markets, State Office Building, Richmond. M. A. HUBBARD, Supervisor of Weights and Measures, State Office Building, Richmond.
City:	
Martinsville	R. M. WILSON, Sealer of Weights and Measures.
Richmond	B. W. RAGLAND, Chief, Bureau of Weights and Measures, City Hall Annex.
County: Arlington	EUGENE M. MORELAND, Sealer of Weights and Measures, Court House, Arlington.

WASHINGTON

State	R. E. WHITE, Supervisor of Weights and Measures, Olympia.
City: Seattle	L. J. ALLEN, Chief Inspector of Weights and Measures, County-City Building.

WEST VIRGINIA

State	P. J. PELLEGRINI, Inspector of Weights and Measures, Charleston. S. M. MILLER, Inspector of Weights and Measures, Martinsburg.
County: Monongalia	BROOKS F. MILLER, Sealer of Weights and Measures, Morgantown.

WISCONSIN

State	GEORGE WARNER, Chief Inspector, Division of Weights and Measures, Capitol Building, Madison.
City: Milwaukee	WILLIAM F. STEINEL, Sealer of Weights and Measures, 1331 North Fifth Street.

OTHER DELEGATES, AND GUESTS APPEARING ON THE PROGRAM

ALLEN, KENNETH C., Development Engineer, Dayton Scale Division, Hobart Manufacturing Co., Dayton, Ohio.
BEAN, H. S., National Bureau of Standards, Washington, D. C.
BEARCE, H. W., National Bureau of Standards, Washington, D. C.

Digitized by Google

BRIGGS, LYMAN J., Director, National Bureau of Standards, Washington, D. C.
CROUCH, RALPH W., JR., National Bureau of Standards, Washington, D. C.
GOULD, R. E., National Bureau of Standards, Washington, D. C.
HOLBROOK, F. S., National Bureau of Standards, Washington, D. C.
HOLMES, EDWARD H., Highway Engineer Economist, Bureau of Public Roads, United States Department of Agriculture, Washington, D. C.
HORTON, C. F., National Bureau of Standards, Washington, D. C.
LETZKUS, C. R., National Bureau of Standards Master Scale Depot, 5800 West 69th Street, Clearing Station, Chicago, Ill.
MILLER, D. R., National Bureau of Standards, Washington, D. C.
MONTGOMERY, D. E., Consumers' Counsel, Agricultural Adjustment Administration, United States Department of Agriculture, Washington, D. C.
PEFFER, E. L., National Bureau of Standards, Washington, D. C.
PIENKOWSKY, A. T., National Bureau of Standards, Washington, D. C.
RICHARD, C. L., National Bureau of Standards Master Scale Depot, 5800 West 69th Street, Clearing Station, Chicago, Ill.
ROPER, HON. DANIEL C., Secretary of Commerce, Washington, D. C.
RUSSELL, H. H., National Bureau of Standards Master Scale Depot, 5800 West 69th Street, Clearing Station, Chicago, Ill.
SAUTHOFF, HON. HARRY, Member of Congress, Second District, Wisconsin, House Office Building, Washington, D. C.
SMITH, RALPH W., National Bureau of Standards, Washington, D. C.
SOUDER, WILMER, National Bureau of Standards, Washington, D. C.

GUESTS REPRESENTING MANUFACTURERS OF WEIGHING AND MEASURING DEVICES

American Can Co.:
ELMER NALL, Special Representative, 104 South Michigan Avenue, Chicago, Ill.
H. B. TOURTELLOT, 230 Park Avenue, New York, N. Y.
Aqua Systems (Inc.): WILLIAM J. PETER, Chief Engineer, 2443 Third Avenue, New York, N. Y.
Barnes Products (Inc.): W. J. BARNES, President, Detroit, Mich.
Black & Decker Manufacturing Co.: E. E. POWELL, Manager, Loadometer Sales, Towson, Md.
Bowser, S. F., & Co. (Inc.):
E. C. MARSH, Vice President, Fort Wayne, Ind.
C. P. GRIFFITH, Chief Engineer, Fort Wayne, Ind.
Buffalo Meter Co.: T. J. HARRINGTON, 2917 Main Street, Buffalo, N. Y.
Chatillon, John, & Sons:
P. T. BORTELL, Vice President, 89 Cliff Street, New York, N. Y.
J. GEORGE HUGEL, 89 Cliff Street, New York, N. Y.
Dayton Pump and Manufacturing Co.: ANTHONY G. HORVATH, Chief Engineer, Dayton, Ohio.
Erie Meter Systems (Inc.): L. R. OLSEN, Chief Engineer, Erie, Pa.
Ex-Cell-O Corporation: RICHARD E. KRENGEL, Experimental and Research Department, 1200 Oakman Boulevard, Detroit, Mich.
Fairbanks, Morse & Co.:
J. F. CRUIKSHANK, General Scale Sales Engineer, 900 South Wabash Avenue, Chicago, Ill.
C. A. HENNIE, Sales Representative, 205 Water Street, Baltimore, Md.
JEROME KENNEY, Sales Representative, 415 Normandy Avenue, Baltimore, Md.
Gilbert & Barker Manufacturing Co.: J. A. LOGAN, Springfield, Mass.
Gurley, W. & L. E.: FRANKLIN G. WILLIAMS, Washington Representative, 3616 Newark Street, Washington, D. C.
Hobart Manufacturing Co.:
S. M. TEMPLETON, Special Representative, Dayton Scale Division, Troy, Ohio.
KENNETH C. ALLEN, Development Engineer, Dayton Scale Division, Dayton, Ohio.
Howe Scale Co.:
C. A. LINDSAY, Special Representative, 1305 Euclid Street, Washington, D. C.
ELWOOD P. VROOME, Eastern Sales Manager, 111 Eighth Avenue, New York, N. Y.

Digitized by Google

International Business Machines Corporation: L. S. SMITHERS, Special Representative, 270 Broadway, New York, N. Y.
Jacobs Bros. Co. (Inc.): J. E. WOODLAND, Sales Manager, Detectogram Division, Main and Water Streets, Brooklyn, N. Y.
Moore & Kling (Inc.): ELMER M. KLING, President, 221 High Street, Boston, Mass.
National Meter Co.: R. H. BARGE, Engineer, 4207 First Avenue, Brooklyn, N. Y.
Neptune Meter Co.:
R. K. BLANCHARD, Vice President, 50 West Fiftieth Street, New York, N. Y.
GLENN D. FRYE, Sales Engineer, 50 West Fiftieth Street, New York, N. Y.
Owens-Illinois Glass Co.: W. S. RICHARDS, Toledo, Ohio.
Peerless Weighing and Vending Machine Corporation:
L. D. CHAMBERS, Vice President, 22–19 Forty-first Avenue, Long Island City, N. Y.
A. J. LILLIEDAHL, Traffic Service Manager, 22–19 Forty-first Avenue, Long Island City, N. Y.
E. M. SCHIEMER, Representative, 22–19 Forty-first Avenue, Long Island City, N. Y.
Pittsburgh Equitable Meter Co.: H. I. BEARDSLEY, Manager, Oil and Gasoline Division, 400 North Lexington Avenue, Pittsburgh, Pa.
Robinson Seal Co.: W. M. ROBINSON, 170 Summer Street, Boston, Mass.
Schirmer-Dornbirer Pump Co.: W. P. SCHIRMER, Manager, Cleveland, Ohio.
Seederer-Kohlbusch (Inc.): J. E. SEEDERER, President, 149 New York Avenue, Jersey City, N. J.
Seraphin Test Measure Co.: THEO. A. SERAPHIN, President, 1314 North Seventh Street, Philadelphia, Pa.
Service Station Equipment Co.: D. S. WILLSON, Research Engineer, Muskegon Heights, Mich.
Sharpsville Boiler Works Co.: CHARLES D. FAGAN, President, Sharpsville, Pa.
Standard Computing Scale Co.: MATTHEW D. RIBBLE, Vice President, Sales Department, Detroit, Mich.
Streeter-Amet Co.: HARRY M. ROESER, Mechanical Engineer, 4101 Ravenswood Avenue, Chicago, Ill.
Tokheim Oil Tank & Pump Co.: GEORGE U. BRAKE, Engineer, Fort Wayne, Ind.
Toledo Scale Co.:
S. Q. BENNETT, Manager of Service and Weights and Measures, 1805 Clinton Street, Toledo, Ohio.
H. W. HEM, Engineer, Toledo, Ohio.
Torsion Balance Co.: A. T. MILLROY, Sales Manager, 92 Reade Street, New York, N. Y.
Wayne Pump Co.:
E. J. GALLMEYER, Vice President and General Manager, Fort Wayne, Ind.
F. S. SHUMAKER, Vice President, 60 East Forty-second Street, New York, N. Y.
CHARLES C. NEALE, Manager, Weights and Measures Division, Fort Wayne, Ind.
JOHN MACARTHUR, District Manager, 4030 North Broad Street, Philadelphia, Pa.
M. C. BROWN, Sales Supervisor, 609 American Building, Baltimore, Md.
Wood, Gar, Industries (Inc.): B. AUSTIN COOPER, Sales Engineer, Detroit, Mich.
Wood, John, Manufacturing Co. (Inc.): ERIC H. BRADLEY, Chief Engineer, Bennett Pumps Division, Muskegon, Mich.

GUESTS REPRESENTING TRADE AND ENGINEERING ASSOCIATIONS

Gasoline Pump Manufacturers Association: G. DENNY MOORE, Managing Director, 420 Lexington Avenue, New York, N. Y.
National Scale Men's Association: C. R. LETZKUS, President, 5800 West 69th Street, Clearing Station, Chicago, Ill.

GUESTS REPRESENTING BUSINESS AND INDUSTRY

BOHART, JAMES G., Sinclair Refining Co., 630 Fifth Avenue, New York, N. Y.
BUCKINGHAM, HAROLD SCOTT, Research Engineer, Silver Seal Dairy Products Corporation, 612 South Twenty-fourth Street, Philadelphia, Pa.
HANNA, J. P., Sinclair Refining Co., 630 Fifth Avenue, New York, N. Y.
MARCHANT, HARRY, Scale Inspector, Bethlehem Steel Co., Sparrows Point, Md.

Digitized by Google

NORMAN, C. H., Carolina Scale Shop, 112 East Morehead Street, Charlotte, N. C.
PAIGE, J. B., Chief Scale Inspector, New York Produce Exchange, 2 Broadway, New York, N. Y.
WHITLEY, ROBERT J., Socony Vacuum Oil Co., Church Street, Albany, N. Y.
ZEIBEL, A. G., Scale Inspector, American Bridge Co., Ambridge, Pa.

GUESTS REPRESENTING RAILROADS

CLARK, ALEX. D., Scale Inspector, Delaware, Lackawanna & Western Railroad, Bayonne, N. J.
HARRISON, M. J. J., Supervisor of Scales and Weighing, Pennsylvania Railroad, Altoona, Pa.
HOSFORD, C. C., Scale Inspector, Pennsylvania Railroad, Pittsburgh, Pa.
LAWRENCE, E. KENT, General Scale Inspector, Baltimore & Ohio Railroad System, Baltimore, Md.
PHERIGO, J. L., Chief Scale Inspector, Southern Railway System, Washington, D. C.
PROPST, H. C., Chief Scale Inspector, Chesapeake & Ohio Railway, Richmond, Va.

GUESTS REPRESENTING GOVERNMENT DEPARTMENTS

DAY, LUCIAN C., United States Tariff Commission, Washington, D. C.
FRISBIE, W. S., Chief, Division of State Cooperation, Food and Drug Administration, United States Department of Agriculture, Washington, D. C.
GAST, FRED W., Chief, Division of Engineering and Weighing, Bureau of Customs, Treasury Department, Washington, D. C.
HOLMES, EDWARD H., Highway Engineer Economist, Bureau of Public Roads, United States Department of Agriculture, Washington, D. C.
MONTGOMERY, D. E., Consumers' Counsel, Agricultural Adjustment Administration, United States Department of Agriculture, Washington, D. C.

OTHER GUESTS

BUCK, CARL J., Lieut. Commander (S. C.), United States Navy, Naval Powder Factory, Indian Head, Md.
JACOBS, EDITH G., Secretary, Scale Journal Publishing Co., 1703 East Eighty-fourth Street, Chicago, Ill.
KEBLER, LYMAN F., 1322 Park Road, Washington, D. C.

Digitized by Google

Digitized by Google

CONTENTS

	Page
Officers and committees	III
Persons attending the Conference	V

FIRST SESSION—MORNING OF TUESDAY, JUNE 1, 1937

A proposal for legislation to fix the standards of weights and measures in the United States, by Lyman J. Briggs, Director, National Bureau of Standards, and President, National Conference on Weights and Measures	1
Abstracts of State reports:	
Alabama, H. S. Holloway	5
California, Charles M. Fuller	5
Connecticut, C. L. Klocker	5
District of Columbia, George M. Roberts	5
Florida, Howard E. Crawford	5
Georgia, S. H. Wilson	6
Idaho, Frank L. Hammon	6
Illinois, John J. Levitt	6
Indiana, Rollin E. Meek	6
Kentucky, William H. Ising, Jr	6
Maine, G. K. Heath	7
Maryland, S. T. Griffith	7
Massachusetts, John P. McBride	7
Michigan, George F. Austin, Jr	7
Minnesota, K. K. Solberg	7
Missouri, Louis G. Waldman	8
Nevada, Joe M. McLeod	8
New Jersey, Charles C. Read	8
New York, C. P. Smith	8
North Carolina, C. D. Baucom	8

SECOND SESSION—AFTERNOON OF TUESDAY, JUNE 1, 1937

Abstracts of State reports—Continued.	
North Dakota, A. J. Jensen	9
Ohio, O. E. Brenneman	9
Pennsylvania, C. J. P. Cullen	9
Rhode Island, Edward R. Fisher	9
South Carolina, A. H. Gibert	10
Tennessee, Tom Webb	10
Texas, W. S. Bussey	10
Vermont, H. N. Davis	10
Virginia, J. H. Meek	10
Washington, R. E. White	11
West Virginia	11
Wisconsin, George Warner	11
Reports of representatives of State associations of weights and measures officials	11
Recent decisions involving the Chicago weighmaster ordinance, by James O'Keefe, Sealer of Weights and Measures, city of Chicago	11
Consumers' interest in adequate weights and measures supervision, by D. E. Montgomery, Consumers' Counsel, Agricultural Adjustment Administration	16
Motion endorsing program outlined above	21

THIRD SESSION—MORNING OF WEDNESDAY, JUNE 2, 1937

General consideration of subjects of interest and questions brought up for discussion by officials	23
Proposed Federal legislation in relation to the financing of weights and measures inspections, by J. H. Meek, Director, Division of Markets, State of Virginia	25
Discussion of above subject	28
Remarks of Hon. Harry Sauthoff, Member of Congress, Second District, Wisconsin	35
Standardization of packages of canned foods, by George Warner, Chief Inspector of Weights and Measures, State of Wisconsin	36
Discussion of above paper	43

Digitized by Google

FOURTH SESSION—AFTERNOON OF WEDNESDAY, JUNE 2, 1937

Page
Demonstration test of motortruck scale with National Bureau of Standards vehicle-scale testing unit ... 45

FIFTH SESSION—MORNING OF THURSDAY, JUNE 3, 1937

Appointment of committees ... 46
Demonstration of recent developments in weighing and measuring apparatus, by representatives of manufacturers ... 46
Results of tests of vehicle scales made with National Bureau of Standards equipment in program of cooperation with States, by Ralph W. Smith, National Bureau of Standards ... 46
Discussion of above paper ... 53
Fundamentals of scale design, by Kenneth C. Allen, Development Engineer, Dayton Scale Division, Hobart Manufacturing Co ... 55
Recently enacted ordinance requiring licensing of scale repairmen, by Alex Pisciotta, Deputy Commissioner, Department of Public Markets, Weights, and Measures, city of New York, N. Y ... 62
Discussion of above subject ... 65
Certification of watchmakers by the Horological Institute of America, by R. E. Gould, Corresponding Secretary ... 66
Presentation to the chairman ... 69
Salesmanship in the weights and measures field, by Robert L. Fullen, Chief Sealer of Weights and Measures, City of Dallas, Texas ... 69
Activities of the National Scale Men's Association, by C. R Letzkus, President, National Scale Mens' Association ... 71

SIXTH SESSION—AFTERNOON OF THURSDAY, JUNE 3, 1937

Tour of the laboratories of the National Bureau of Standards ... 74

SEVENTH SESSION—MORNING OF FRIDAY, JUNE 4, 1937

Report of the Committee on Specifications and Tolerances, presented by F. S. Holbrook, chairman, and discussion thereon ... 75
Address by Hon. Daniel C. Roper, Secretary of Commerce ... 84
The use of vehicle scales in the highway planning survey, by Edward H. Holmes, Highway Engineer Economist, Bureau of Public Roads, United States Department of Agriculture ... 87
Discussion of report of the Committee on Specifications and Tolerances—Continued ... 90
The appearance in trade of liquid measures of nonstandard sizes, by Rollin E. Meek, Chief, Bureau of Weights and Measures, State of Indiana ... 103
Citation by officials of important court decisions in their jurisdictions ... 107
Report of Committee on Nominations, presented by John P. McBride, chairman, and election of officers ... 108
Report of Committee on Resolutions, presented by John J. Levitt, and adoption of resolutions:
Appreciation to Director and staff of the National Bureau of Standards ... 108
Appreciation to management of headquarters hotel ... 108
In memory of deceased members ... 109
Appreciation to the press and to the Scale Journal ... 109
Endorsement of proposed bill to fix the standards of weights and measures of the United States ... 109
Appreciation to officials cooperating ... 109
Endorsement of proposed Federal legislation for standardization of packages for canned foodstuffs (H. R. 6964) ... 109
Endorsement of principle of general standardization of packaged goods ... 110
Regulation of used commercial weighing devices, and licensing of scale repairmen ... 110
Modification of specifications for small-capacity spring scales ... 110
Resolution in relation to labeling electric-light bulbs ... 110
Report of the treasurer, George F. Austin, Jr ... 113
Dates for and conduct of Conference ... 113
Paper containers for milk ... 115

APPENDIX

Data on the vehicle-scale testing unit of the National Bureau of Standards, and on records and reports prepared in connection therewith ... 117

Digitized by Google

REPORT OF THE TWENTY-SEVENTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

HELD AT THE NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C., JUNE 1, 2, 3, AND 4, 1937

FIRST SESSION—MORNING OF TUESDAY, JUNE 1, 1937

(The Conference was called to order at 10:50 a. m., by Dr. Lyman J. Briggs, President of the Conference.)

The CHAIRMAN. Members of the Twenty-Seventh Conference on Weights and Measures, ladies, and gentlemen: It is a great pleasure to welcome you to this Twenty-Seventh Conference on Weights and Measures. Mr. Holbrook advises me that more delegates have announced their intention of attending this Conference than at any preceding Conference. To those who are joining with us in these deliberations for the first time I extend a special welcome.

I shall now ask your indulgence while I review briefly the history of weights and measures in this country, in order to provide a background for your consideration of a bill to fix the standards of weights and measures.

A PROPOSAL FOR LEGISLATION TO FIX THE STANDARDS OF WEIGHTS AND MEASURES IN THE UNITED STATES

By LYMAN J. BRIGGS, *Director, National Bureau of Standards, and President, National Conference on Weights and Measures*

It seems strange, 150 years after the founding of this Republic, that legislative action should be necessary to fix the value of the inch and pound with which we are so familiar. Nevertheless, the fact is that we have never had a statute which defines the way in which these units shall be determined. As a background for the legislation under consideration, it may be of interest to review briefly the legislative history of weights and measures in our country.

Presumably the difficulties under which commerce had been carried out among the 13 Colonies, owing to the lack of uniform standards, were responsible in part for that wise and far-sighted provision of the Constitution which delegated to Congress the authority "to fix the standard of weights and measures." It is remarkable that under such circumstances Congress did not take prompt steps to correct the situation. In the early days of the new Republic, Washington in his presidential messages to Congress, repeatedly urged the importance of carrying out this constitutional provision; but for 80 years no formal action was taken by Congress to "fix" the standard, save for the adoption in 1828 of a standard troy pound for coinage purposes.

Not that the subject was ignored. Repeatedly the matter came up for discussion, without definite action. A standard of length which could, if necessary, be independently reproduced from physical obser-

Digitized by Google

vations repeatedly intrigued the interest of Congress. Jefferson, as Secretary of State, presented in 1790 an elaborate report on weights and measures, including the proposal of a standard of length based upon the length of a uniform cylindrical pendulum beating seconds at sea level at 45° N. lat. In 1795, President Washington presented to Congress a communication from the Minister of the French Republic suggesting the adoption by the United States of the metric system of weights and measures, which France had adopted 4 years earlier. This proposal, however, met with little favor. A standard based on the length of one ten-millionth of the earth's quadrant apparently had less appeal from the standpoint of reproducibility than one based on the length of a pendulum beating seconds.

Meanwhile, various State legislatures were imploring Congress to take some action to bring about uniformity; and in 1821, John Quincy Adams, as Secretary of State, urged Congress "to fix the standard with the partial uniformity of which it is susceptible at present, excluding all innovations. To consult with foreign nations for the future and ultimate establishment of universal and permanent uniformity."

In 1830 the United States Treasury Department, which was charged with the collection of customs, was instructed through a resolution of the Senate to investigate the weights and measures in use in the various customs houses of the country, with a view to bringing about uniformity in the collection of customs. The Secretary of the Treasury gave a broad interpretation to this authority to "investigate" and the outcome was the adoption by the Treasury Department, without further action by Congress, of an avoirdupois pound of 7,000 grains, a yard of 36 inches, a wine gallon of 231 cubic inches, and a Winchester bushel of 2,150.42 cubic inches, for use in the collection of customs.

So well pleased was Congress with this solution of its difficulties that the Secretary of the Treasury in 1836 was directed through a joint resolution to deliver to the Governor of each State a complete set of all the weights and measures adopted as standard by the Treasury Department. Although no congressional action was taken to legalize these standards, many of the States adopted them independently, and a groundwork for uniform weights and measures was at last provided.

It was not until after the Civil War that Congress took the first formal steps to legalize a system of weights and measures, and this oddly enough did not refer to the weights and measures in common use, but to the metric system, rejected in 1795. The act of 1866 reads as follows: "It shall be lawful throughout the United States of America to employ the weights and measures of the metric system; and no contract or dealing, or pleading in any court, shall be deemed invalid or liable to objection because the weights or measures expressed or referred to therein are weights or measures of the metric system."

We have thus the anomalous situation in this country of a legalized system of metric weights and measures which is not in common use, and a customary system of weights and measures which has never been formally legalized. However, in the act of 1866 Congress did include a table of conversion factors which "may lawfully be used" in going from one system to the other. That Congress intended this table only as an approximation to the true ratio of the units in the two systems is evident from the fact that the meter is given as equivalent to 39.37 inches, while the millimeter is rounded off to 0.0394 inch.

Digitized by Google

The platinum-iridium meter and kilogram, supplied to our Government as a result of its participation in the Metric Convention, provided this country with far better material standards than it had ever had before. Both the meter bar and the kilogram had been carefully compared with the international prototypes, and the coefficient of expansion of the meter bar had been measured. Moreover, they constituted, together with the troy pound, the only legal material standards possessed by the Government. Accordingly, in the absence of further congressional action, Superintendent Mendenhall, of the Coast and Geodetic Survey, in 1893 issued the following order: "The Office of Weights and Measures, with the approval of the Secretary of the Treasury, will in the future regard the international prototype meter and kilogram as fundamental standards, and the customary units, the yard and the pound, will be derived therefrom in accordance with the act of July 28, 1866." To pass from the meter to the inch the Office of Weights and Measures adopted the conversion factor, 1 meter equals 39.37 inches exactly, as set up in the act of 1866; and this ratio has been adhered to since that time.

The British inch, derived directly from the Imperial yard, is about four parts in a million shorter than the United States unit. The conversion factor, 1 inch equals 25.4 millimeters exactly, as specified in the proposed legislation, falls between the present accepted values of the British and the United States inch.

The change of two parts in a million in the magnitude of the inch will not affect industry in the slightest because it falls far within the tolerances employed in industrial measurements. (A change of only 1° C in the temperature of a steel gage block changes its length by 10 parts in a million—five times the proposed change in the unit itself.) As a matter of fact, the conversion factor, 1 inch equals 25.4 millimeters, has recently been adopted for industrial purposes by standardizing groups in 15 countries, including the United States and Great Britain.

In certain kinds of precise measurements of length, such as the difference in length of two gage blocks, it is often advantageous to use the optical method of interferometry. When employing this method, one must know the exact wave length of the light being used. The proposed legislation authorizes this procedure for purposes of standardization and specifies the wave length of the strong red line in the spectrum of cadmium, together with its reciprocal—the number of these light waves in 1 meter.

The bill which has been submitted to the Secretary of Commerce for transmittal to Congress reads as follows:

A BILL

To define certain units and to fix the standards of weights and measures of the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the meter adopted by Congress July 28, 1866 (U. S. Code, title 15, chap. 6, sec. 205), as a legal unit of length shall be defined as the distance, at 0° centigrade, between the axes of two median lines engraved upon the bar of platinum-iridium deposited in the International Bureau of Weights and Measures, and declared to be the international prototype of the meter by the First General Conference on Weights and Measures, this bar being subjected to normal atmospheric pressure and supported by two rollers not less than a centimeter in diameter situated symmetrically in the same horizontal plane and at a distance of 571 millimeters the one from the other.

Digitized by Google

SEC. 2. That the United States inch shall be a legal unit of length defined as the distance comprising two hundred fifty-four ten-thousandth parts (0.0254) of the distance defined as the meter.

SEC. 3. That the United States primary standard for the determination of the legal units of length, the meter and the inch, from which all other legal units or measures of extension, whether linear, superficial, or solid, and all legal units of capacity, except as otherwise provided herein, shall be derived and ascertained, shall be the platinum-iridium bar known as National Prototype Meter No. 27, which was received by the United States from the International Bureau of Weights and Measures in 1890, and which is now in the custody of the National Bureau of Standards. The length of the graduated interval on the bar shall be the value certified by the International Bureau of Weights and Measures: *Provided, however*, That it shall also be legal to use for standardization purposes the following supplementary relations: (a) the wave length of the red radiation from cadmium equals six thousand four hundred thirty-eight and four thousand, six hundred ninety-six ten-thousandths times ten to the minus tenth power ($6438.4696 \times 10^{-10}$) meter, under standard conditions as specified by the International Committee of Weights and Measures, and (b) one (1) meter equals one million, five hundred fifty-three thousand, one hundred sixty-four and thirteen one-hundredths (1 553 164.13) wave lengths of the red radiation from cadmium, under the same specified conditions, these values being those provisionally approved by the Seventh General Conference on Weights and Measures, held in 1927, and published in Comptes Rendus des Séances de la Septième Conférence Générale des Poids et Mesures.

SEC. 4. That the kilogram shall be a legal unit of mass defined as the mass of the cylinder of platinum-iridium deposited in the International Bureau of Weights and Measures and declared to be the international prototype of the kilogram by the First General Conference on Weights and Measures.

SEC. 5. That the United States avoirdupois pound shall be a legal unit of mass defined as the mass comprising four billion, five hundred thirty-five million, nine hundred twenty-four thousand, two hundred seventy-seven ten-billionth parts (0.453 592 427 7) of the mass of the kilogram.

SEC. 6. That the United States primary standard for the determination of the legal units of mass, the kilogram and the pound, from which all other legal units of mass or weight, and units involving mass or weight, shall be derived and ascertained, shall be the platinum-iridium cylinder known as National Prototype Kilogram No. 20, which was received by the United States from the International Bureau of Weights and Measures in 1890, and which is now in the custody of the National Bureau of Standards. The mass of this cylinder shall be the value certified by the International Bureau of Weights and Measures.

SEC. 7. That the United States troy ounce, and the United States apothecaries' ounce, shall each be a legal unit of mass defined as a mass comprising four hundred eighty seven-thousandth parts (480/7000) of the mass of the United States avoirdupois pound. The carat shall be a legal unit of mass defined as a mass comprising two ten-thousandth parts (0.0002) of the mass of the kilogram.

SEC. 8. That the United States gallon shall be a legal unit of capacity defined as a capacity of two hundred thirty-one (231) cubic inches.

SEC. 9. That the United States bushel shall be a legal unit of capacity defined as a capacity of two thousand, one hundred fifty and forty-two one-hundredths (2,150.42) cubic inches.

SEC. 10. That the liter shall be a legal unit of capacity defined as the volume occupied by the mass of one kilogram of pure water at its maximum density and under normal atmospheric pressure.

It will be evident from the wording of the proposed legislation that it is not in any sense a proposal to use the metric system in place of our present customary system of weights and measures. On the contrary, it is a proposal to establish legally the standards which define the weights and measures now in use. It uses for this purpose the platinum-iridium meter no. 27 and kilogram no. 20, because they are the best material standards of length and mass which this Government possesses. By defining the inch and the pound as certain specified fractions of the meter and the kilogram, we base our customary system of weights and measures on material standards that have been shown through the observations of the past 40 years to be highly stable and constant in value. But in so doing, we do not for a

Digitized by Google

moment relinquish the units of our customary system of weights and measures. On the contrary, for the first time in the history of our country their values will be definitely established by this legislation.

ABSTRACTS OF STATE REPORTS [1]

ALABAMA

By H. S. HOLLOWAY, *Chief, State Division of Weights and Measures*

Mr. Holloway reported an amendment to the law in relation to milk bottles, fixing a penalty on the dealer in illegal bottles, and observed that the stamping out of illegal sizes, especially the ⅓ quart, was a principal problem in law enforcement. He stated that the State rules and regulations for weighing and measuring devices were amended from time to time to keep these in conformity with the Conference recommendations.

CALIFORNIA

By CHARLES M. FULLER, *Sealer of Weights and Measures, Los Angeles County*

In the absence of Mr. Tucker, who had been delayed in arrival, Mr. Fuller reported the passage of several amendments to the State law; one of these had the effect of putting all county sealers under civil service, another made it the duty of local officials to attend annual meetings of the State association, a third required the sale by weight of all meats, poultry, and fish. He mentioned the success obtained by various methods of publicity, including newspaper articles, radio talks, and motion pictures.

CONNECTICUT

By C. L. KLOCKER, *Inspector, Department of State Police*

Mr. Klocker reported that one amendment to the law had been passed providing a penalty for removing an official seal or condemning tag from apparatus; other amendments under consideration would require that fuel oil and gasoline at wholesale be sold by vehicle-tank compartment or by meter, and that coal be weighed by a licensed public weigher. He mentioned that the State was procuring a large-capacity scale-testing equipment.

DISTRICT OF COLUMBIA

By GEORGE M. ROBERTS, *Superintendent of Weights, Measures, and Markets*

Mr. Roberts reported that the increase made last year in his inspection staff had rendered it possible to give especial attention to the suppression of dishonest competition. He mentioned a provision in the current appropriations bill providing for the enforcement of the license laws by his department. He also spoke of the loss sustained through the death of W. C. Diller, his principal assistant for 15 years.

FLORIDA

By HOWARD E. CRAWFORD, *Inspector of Weights and Measures, City of Jacksonville*

Mr. Crawford reported that no general State-wide inspection of weights and measures was required by law; however satisfactory prog-

[1] For convenience of reference, these reports have been arranged in alphabetical order throughout.

Digitized by Google

ress was being made in Jacksonville. He mentioned the tests of vehicle scales made in his jurisdiction by the National Bureau of Standards equipment. This had resulted in much good; one of the results was that installations of these scales would hereafter be made under his supervision.

GEORGIA

By S. H. Wilson, *State Oil Chemist*

Mr. Wilson reported the continued failure of the State to enact a general weights and measures law; however the visit of the vehicle-scale testing equipment of the National Bureau of Standards had stimulated interest and had provided accurate data as to conditions in this respect which could not have been obtained in any other way; he hoped this would ultimately result in the passage of legislation. Meanwhile, the State-wide inspection of gasoline-measuring equipment was continuing.

IDAHO

By Frank L. Hammon, *Director, State Bureau of Weights and Measures*

Mr. Hammon reported that a great deal of difficulty was being caused by the installation of obsolete scales which were not susceptible of indicating accurate weights, for the purpose of weighing livestock. An attempt would be made to secure a law requiring that a used scale could not be installed before its approval by his Bureau had been obtained. He also said that new and heavier apparatus for the testing of large-capacity scales was being procured.

ILLINOIS

By John J. Levitt, *Superintendent, State Division of Standards*

Mr. Levitt reported that the outstanding accomplishment of the year was the inauguration of a competent large-capacity scale-testing service. The new equipment was very dependable and economical in operation, it was revealing inaccuracies in scales which were resulting in their condemnation for repair or replacement, and it had the universal approval of owners and operators of motortruck scales.

INDIANA

By Rollin E. Meek, *Chief, State Bureau of Weights and Measures*

Mr. Meek reported that the State was continuing its policy of keeping its codes of specifications and tolerances uniform with the Conference codes by incorporating amendments adopted by the Conference. He also reported increased activity on the part of local weights and measures officials. The State equipment actively continued its work of testing large-capacity scales and is gradually eliminating scales which are inaccurate, poorly installed, or of faulty construction.

KENTUCKY

By William H. Ising, Jr., *Inspector of Weights and Measures, City of Louisville*

Mr. Ising reported that in his State there still was no State-wide inspection of the commercial weights and measures in use. In Louisville a special survey on accuracy of marked weights on package goods had been made; 15 percent of the packages were found not to be

Digitized by Google

accurately marked. In the absence of a proper vehicle-scale testing equipment these scales were being tested with heavy loads weighed on a master scale.

MAINE

By G. K. HEATH, *Deputy State Sealer of Weights and Measures*

Mr. Heath reported the adoption of new rules and regulations, one outlawing the measuring stick for the determination of quantity in sales of gasoline and fuel oils, another requiring air eliminators on new installations of gasoline pumps other than those of the visible-bowl type; a number of the codes of specifications and tolerances of the National Conference had also been adopted. The law was amended specifically to include devices indicating prices, as well as weight or measure.

MARYLAND

By S. T. GRIFFITH, *Inspector of Weights and Measures, City of Baltimore*

Mr. Griffith reported the passage by the legislature of a resolution requesting the Governor to appoint a committee to make a survey of weights and measures conditions throughout the State and to make a report, with recommendations, before the next session. It is felt that this may result in the passage of competent State legislation. As a result of the passage of a law requiring that coal be sold only over tested scales, Baltimore is now obliged to test large-capacity scales located outside the city limits.

MASSACHUSETTS

By JOHN P. MCBRIDE, *Director, State Division of Standards*

Mr. McBride reported the adoption of a regulation in relation to metered deliveries from vehicle tanks designed to prevent the delivery of short measure through the incorporation of air in the liquid being delivered through a meter. He summarized the results of State tests of vehicle scales and pointed out some of the more common causes of failure. The results of a special survey on weights of butter in prints were given including figures on probable losses through shrinkage.

MICHIGAN

By GEORGE F. AUSTIN, JR., *Supervising Inspector of Weights and Measures, City of Detroit*

Mr. Austin reported the very recent and sudden death of Hon. Burr Lincoln, Commissioner of Agriculture for the State, who had long been active in weights and measures administration. As a result it was not practicable to carry through plans made for the State department to be represented at the Conference.

MINNESOTA

By K. K. SOLBERG, *State Supervisor of Weights and Measures*

Mr. Solberg reported that through the reorganization of his department the inspection work was being conducted more efficiently than formerly, and a greater number of inspections were being made; however, the shortage of funds and equipment was acute. An effort

Digitized by Google

was now being made to procure four new large-capacity scale-testing equipments to supplant eight lighter equipments which had become obsolete, in the testing of livestock and vehicle scales.

MISSOURI

By Louis G. Waldman, *Commissioner of Weights and Measures, City of St. Louis*

Mr. Waldman reported that although there was, as yet, no State-wide inspection of weights and measures, increased interest was being manifested in the passage of a State law; he was officially representing the State at the Conference in order to obtain information to be used as a basis for recommendations. In the city of St. Louis an ordinance had been prepared designed to codify the many weights and measures ordinances now in force.

NEVADA

By Joe M. McLeod, *State Inspector of Weights and Measures*

Mr. McLeod reported that as a result of the very large area and the small population of his State, the Department was faced with special problems of administration not ordinarily encountered elsewhere. Consideration was now being given to the procurement of equipment for testing large-capacity scales which would be competent to test such scales and yet mobile enough to cover the State.

NEW JERSEY

By Charles C. Read, *State Superintendent of Weights and Measures*

Mr. Read greeted the delegates and stated that he would ask Joseph G. Rogers to report. Mr. Rogers reported an intensive drive against the bootleg coal traffic and the introduction of additional legislation deemed necessary for proper control; large increases in reweighings of general commodities; the appearance of a tendency to degrade the quality of hanging spring scales; and plans for the more effective regulation of deliveries of fuel oil.

NEW YORK

By C. P. Smith, *Sealer of Weights and Measures, Suffolk County*

In the absence of a representative of the State Bureau of Weights and Measures, Mr. Smith reported that no important legislation in relation to weights and measures has been enacted in the State during the year.

NORTH CAROLINA

By C. D. Baucom, *State Superintendent of Weights and Measures*

Mr. Baucom reported that the appropriation for weights and measures work in his State had been very substantially increased. As a result the procurement of apparatus for the testing of electricity, gas, and water meters was contemplated; also plans had been formulated to provide more nearly adequate tests on large-capacity scales. The State law was amended to eliminate the sale of corn by the bushel, dry measure, on the cob, or with cob and shuck.

(At this point, at 1:00 p. m., the Conference took a recess until 2 p. m.)

Digitized by Google

SECOND SESSION—AFTERNOON OF TUESDAY, JUNE 1, 1937

(The Conference reassembled at 2:20 p.m., Dr. Lyman J. Briggs, President of the Conference, in the chair.)

ABSTRACTS OF STATE REPORTS—Continued

NORTH DAKOTA

By A. J. JENSEN, *State Superintendent of Weights and Measures*

Mr. Jensen reported that the specifications and tolerances for apparatus, in his State, were those adopted by the National Conference. Difficulty had been experienced through the sale of second-hand scales which had been condemned in adjoining jurisdictions; as a result a regulation had been promulgated prohibiting the sale of such a scale until it had been approved. He gave figures as to the number of pieces of apparatus tested.

OHIO

By O. E. BRENNEMAN, *Chief Deputy State Sealer of Weights and Measures*

Mr. Brenneman reported the passage of legislation which required that all scales used in the purchase and sale of live stock must be tested by the State four times a year, and that the weighers must be bonded. This act was to be enforced jointly by the Bureaus of Weights and Measures, and of Animal Industry. It was contemplated that it would be necessary to procure new equipment to carry out these provisions.

PENNSYLVANIA

By C. J. P. CULLEN, *Director of Standard Weights and Measures*

Mr. Cullen described two large-capacity scale testing trucks recently put into service and reported the success that had attended this testing work. Eighty-four percent of the scales tested, over which material purchased by the State was weighed, had been condemned; 59 percent of the tipple scales tested at mines were found weighing short, and many heavy-duty commercial scales had also been tested. He said that it was impossible to meet the requests for tests being made.

(At this point, Mr. C. D. Baucom, Vice President of the Conference, assumed the chair.)

RHODE ISLAND

By EDWARD R. FISHER, *Chief, State Bureau of Weights and Measures*

Mr. Fisher reported that there had been no changes in the weights and measures law, the legislature having acted unfavorably on the bills which had been presented at the session. He mentioned the work of his Bureau in gathering evidence of short measure deliveries in the case of an oil concern which had a contract with a State agency; as a result six prosecutions were pending for violations of weights and measures laws.

Digitized by Google

SOUTH CAROLINA

By A. H. GIBERT, *Chief State Inspector of Weights and Measures*

Mr. Gibert read a report submitted by Hon. J. Roy Jones, Commissioner of Agriculture. It was said that the work done in the State by the vehicle-scale testing equipment of the National Bureau of Standards had been greatly appreciated by the owners of the scales, and had shown the importance of proper equipment. The provisions of contemplated Federal legislation for financial assistance to the States for enforcement of weights and measures laws were endorsed.

TENNESSEE

By TOM WEBB, *Sealer of Weights and Measures, City of Nashville*

Mr. Webb reported that there was no State-wide inspection of weights and measures in his State. However, a State law had been enacted under which the rules and regulations of the National Conference might be adopted. In Nashville the principal difficulty encountered had been with truckers of coal from mines. However, the enforcement of a new city ordinance had bettered conditions in this respect to some extent.

TEXAS

By W. S. BUSSEY, *Chief, State Division of Weights and Measures*

Mr. Bussey reported that 3,000 vehicle tanks had been tested at the six testing stations operated, that a greater amount of work had been done in relation to cotton weights, and that the Division had been very active in the enforcement of the law in relation to butterfat tests. Appropriations for the Division had been greatly increased; also a special appropriation had been secured to purchase two vehicle-scale testing trucks and these would be delivered shortly.

VERMONT

By H. N. DAVIS, *Deputy State Commissioner of Weights and Measures*

Mr. Davis reported three amendments to the State law: The Division of Weights and Measures was transferred from the Department of Industries to the Department of Agriculture, the change being made to eliminate overlapping functions especially in creamery inspection work; the mandatory licensing of scale repair men was provided for; and the Vermont log rule was adopted as the basis of determining the number of board feet in the log for purposes of purchase and sale.

VIRGINIA

By J. H. MEEK, *Director, Division of Markets*

Mr. Meek reported that while weights and measures inspection work had advanced materially in Virginia, there was still need for increased activity, especially in connection with the testing of scales. He mentioned the helpful work being done by the training school for weights and measures officials, conducted by the League of Virginia Municipalities in cooperation with the Division of Markets and the State Division of Trade and Industrial Education.

Digitized by Google

WASHINGTON

By R. E. WHITE, *Supervisor, State Division of Weights and Measures*

Mr. White discussed the organization of weights and measures inspection work in his State; three cities had weights and measures departments, while in the remainder of the State the work was done by State inspectors. It was planned to procure a portable trailer equipment for the testing of vehicle-tank compartments and large meters. The truck used in the testing of large-capacity scales worked out well, although the load of test weights was not large.

WEST VIRGINIA

(While the State of West Virginia was represented by official delegates no report was presented at the meeting.)

WISCONSIN

By GEORGE WARNER, *Chief State Inspector of Weights and Measures*

Mr. Warner discussed pending legislation: One bill would require that in the case of second convictions for weights and measures offenses the facts should be prominently published in a newspaper; another had to do with the feeding and watering of livestock before sale and would require the testing of livestock scales once in 30 days. He mentioned a unique law of his State forbidding the advertising of the retail price of food in package form unless actual contents was set forth.

REPORTS OF REPRESENTATIVES OF STATE ASSOCIATIONS OF WEIGHTS AND MEASURES OFFICIALS

At this point brief reports of the activities of State associations were presented as follows:

California Sealers' Association, Charles M. Fuller.
Illinois Weights and Measures Association, James O'Keefe.
Indiana Association of Inspectors of Weights and Measures, C. B. Tolan.
Massachusetts Association of Sealers of Weights and Measures, Lorenzo D. F. Marston.
Michigan Association of Weights and Measures Officials, George E. Rutlidge.
New York State Association of Sealers of Weights and Measures, Robert Williams.
Ohio Sealers' Association, J. C. Tinkey.
Pennsylvania Association of Inspectors of Weights and Measures, C. J. P. Cullen.
Texas Weights and Measures Association, W. S. Bussey.
Virginia Weights and Measures Association, B. W. Ragland.
Wisconsin Training Course for Sealers of Weights and Measures, George Warner.

RECENT DECISIONS INVOLVING THE CHICAGO WEIGHMASTER ORDINANCE

By JAMES O'KEEFE, *Sealer of Weights and Measures, City of Chicago*

Chicago has been maintaining her aggressive spirit and active carry-on in the interest of securing honest weights for the public.

Digitized by Google

Back in the year 1922 the city conducted a weights and measures crusade of wide importance by putting into her municipal code regulations providing that all bulky commodities sold in load lots by weight and delivered by wagon, truck, or other vehicle should be weighed on public weighmasters' scales, that public weighmasters' certificates of weight should be delivered to the purchaser at the time of delivery and before unloading, and that no public weighmaster should state in his certificate the tare weight of the vehicle until after weighing the vehicle. These enactments, together with their vigorous enforcement by the Weights and Measures Department, produced a salutary effect and did much to clean up conditions then prevailing in regard to short weighing, the use of padded weight tickets, the substitution of a different kind of coal for the coal billed and the mixing of an inferior grade with coal of a superior grade and quality. Conditions had become so bad that many reputable dealers were confronted with the situation of securing protection against such unfair trade practices or going out of business.

To thwart the enforcement of the provisions, certain recalcitrants instituted injunction proceedings in the courts. The Supreme Court of Illinois, however, upheld the validity of the ordinance and in its opinion commended it. Comment was made upon the lack of available means, without the ordinance, of detecting the short weigher and preventing him from continuing his nefarious practices when relying merely upon the State statute making sale by false weights a criminal offense. The court said:

> Purchasers of a commodity by weight already had that protection but no way to enforce it. In buying ordinary articles the buyer generally may see the article weighed or have the means at hand to ascertain whether it is short weight, but when applied to load lots it was and is impossible for the purchaser to determine the weight of the load. The purpose of the ordinance was most commendable and essential to secure to the purchaser the weight of the commodity purchased and paid for. (*City of Chicago* v. *Wisconsin Lime & Cement Co.* (1924), 312 Ill. 520, 144 N. E. 3.)

The defeated party made an unsuccessful attempt to induce the Supreme Court of the United States to disturb the decision of the State Supreme Court upholding the ordinance. (*Wisconsin Lime & Cement Co.* v. *Chicago* (1926), 270 U. S. 626.) Thus from 1924 on, consumers of coal and law-abiding coal dealers enjoyed the protection of these code provisions.

During the recent depression coal buyers very naturally sought to save money on their coal bills. To satisfy the demand of persons looking for cheap coal, numbers of unemployed men, mostly nonresidents of Chicago, who owned or had the use of trucks, began hauling coal into Chicago from the northern part of Illinois, 60 to 100 miles away. This free-lance, nondescript group received encouragement from mine owners who sought the opportunity of profiting by opening up strip or surface mines and running cheap grades of coal into Chicago. A business approximating in volume 1,200 tons per day developed.

By January 1935, hundreds of truckers were engaged in this business of trucking coal from mines to Chicago consumers. Each trucker marketed the coal in any way he saw fit, without regard to ordinances or to honesty. The mines engaged agents in Chicago who advertised in the daily papers "mine to consumer" cheap coal. The coal user was at the mercy of the truckers in the matter of correct weights and representations as to grade of coal. He had no adequate way to pro-

Digitized by Google

tect himself and no responsible coal dealer to look to. To regulate this miscellaneous group of nonresident truckers was difficult, since there was no central control. When short weights were discovered the usual procedure of instituting municipal court prosecutions was futile because service of process outside of Chicago could not be obtained and many of the truckers, as said before, lived outside the city's limits and were irresponsible.

The owners of the mines interested in this business were then consulted and were requested to refuse to sell coal to truckers who were convicted of short-weight practices. The mine owners replied that they were in the business of selling coal and would sell to anyone, regardless of who he was; they said, furthermore, that they, the mine owners, were not responsible for what happened to the coal or to the Chicago consumer after the coal was loaded on the trucks at the mines. To increase their sales the mine owners not only abetted the free-lance truckers but battled to secure for the truckers their claimed right to continue their libertine practices. At the same time the mine owners disclaimed that the truckers were their agents and advanced the theory, later refuted by the courts, that the truckers were the agents of the coal users.

This situation was a direct challenge to the city's ordinance and demanded vigorous action on the part of the city sealer, who again renewed his prosecutions to compel compliance with the municipal law. Section 2947 of the city's code again became the subject of controversy. This section provides as follows:

2947. Commodities sold in load lots. Every load of any commodity, produce, or other article or articles of merchandise sold in load lots by weight, delivered by wagon, truck, or other vehicle within the city, shall be weighed by a public weighmaster; a certificate of weight for each such load, issued by such public weighmaster, shall be delivered by the driver or person in charge of the wagon, truck, or other vehicle used in the delivery, to the purchaser or consignee of such load, or to his or their agent at the time of the delivery and before any of the commodity, produce, or other article or articles of merchandise is removed from the vehicle, or such certificates shall be delivered to the inspector of weights and measures, or any of his deputies upon his or their demand. When delivery is made, in case no person is present to receive such commodity, produce, or other article or articles of merchandise, and if the purchaser or consignee, or his or their agent, cannot be located, then the memorandum or certificate of weight hereinbefore provided for shall be posted conspicuously at the place of delivery before any of the commodity, produce, or other article or articles of merchandise is removed from the vehicle.

The "punch" in this section is found in the requirement that the public weighmaster's certificate of weight was required to be delivered to the customer *before* the coal was unloaded.

Of course, before a weighmaster could properly certify the gross, tare, and net weights, he was obliged to weigh the empty truck.

The truckers then found that they could not obtain certified weight tickets until they appeared at the weighmasters' scales, unloaded their coal so as to give the weighmasters opportunity to ascertain the correct tare weight, and then reloaded it so that the gross could be obtained and the weighmasters could then certify to the correct net weight. Determined attempts to evade or defeat the ordinance followed. The city's Department of Weights and Measures decided it would be necessary to arrest immediately all truckers who did not comply with the ordinance. When arrests were made the mine owners, who had previously taken the position that they were not concerned with the method of delivery, paid high-priced lawyers to defend

Digitized by Google

the truckers and to obtain injunctions restraining the city and its officials from enforcing the ordinance. A suit for injunction was instituted in the Superior Court of Cook County by the most prominent of the mine owners. The city Law Department was successful in resisting the motion for temporary injunction and the plaintiff corporation then dissolved its Illinois corporation, reincorporated under the the laws of the State of Delaware, and filed a new injunction suit in the United States District Court of Chicago upon the ground of diversity of citizenship. After a hearing in this case before United States District Judge Woodward, plaintiff's motion for injunction was denied, and later on the case was dismissed for want of equity. Concurrently with the State and Federal court injunction litigation, appeals were taken to the Supreme Court of the State of Ilinois from judgments convicting and fining truckers for violating the ordinance. These cases were decided February 14, 1936, by an exhaustive opinion of the State Supreme Court, which fully sustained the city's ordinance. The court's opinion held that the truckers were the agents of the coal mines and that the contracts of sale were made in Chicago, the place of delivery of the coal, and not at the mines; that the ordinance was strictly within the police power of the city, as the delivery of true weights to the consumer is a matter clearly related to the public welfare. After commenting upon the fact that the opportunity to defraud the consumer in the sale of coal in load lots is great and that the consumer has no adequate way to protect himself against being cheated, and that the city had the right to adopt the ordinance as a police power measure in order to insure true weights to the consumer, the court said:

> The defendants, nonresidents of the city of Chicago, are asking for a practice of weighing, as applied to the business done by them in the city, which under the ordinance here would not apply to those truckers living in the city and delivering coal from the local yards or local dealers in the city to the consumer. To recognize the demand of the defendants would be to discriminate between the local truckmen and dealers in Chicago in favor of nonresidents. * * * If the defendant nonresidents desire to compete in the trucking business in the Chicago market they must submit to the requirements of the ordinance regulating the business. The facts, if there be such, that it may be necessary to establish coal yards in Chicago, ship by rail in car-load lots, unload from the car and deliver to the purchaser, or submit to an unloading and reweighing of the coal in the event that coal moves into Chicago by trucks, are incidental problems, to be solved by the coal company in the event it desires to sell in the Chicago market. There is no discrimination made by the ordinance against the defendants. (*City of Chicago* v. *Waters*, 363 Ill. 125, 1 N. E. (2d) 396.)

Even after this body blow the mines and nonresident truckers did not stop fighting. Taking encouragement from a dissenting opinion which had been filed in the Illinois case, they then appealed to the Supreme Court of the United States, where they contended that the city's ordinance deprived them of property without due process of law in violation of the Fourteenth Amendment to the Federal Constitution. The case was presented to the high court at Washington upon extensive printed briefs and the oral arguments of the company's attorneys who appeared for one of the truckers whose conviction had been sustained by the State Supreme Court, and of Assistant Corporation Counsel Col. Martin H. Foss representing the city of Chicago. On January 4, 1937, the court delivered its unanimous opinion affirming the decision of the Supreme Court of Illinois and upholding the

Digitized by Google

constitutionality of the city's ordinance. In concluding its opinion the United States Supreme Court said:

> For many years, * * *, Chicago has rightly required local truckmen to comply with the ordinance. Since the evil to be prevented is no less imminent when coal comes by truck from without the city, a like requirement as to this seems equally important. The ordinance makes no discrimination of which appellant can complain; and no adequate reason has been suggested for concluding that although valid as to local truckers it violates rights guaranteed to him by the Fourteenth Amendment.
>
> That the coal delivered by appellant was weighed at the mine on tested scales is stressed; but this is not really material. Chicago had no control there and such weighing afforded no adequate protection against fraud. The opportunities for manipulation thereafter are obvious. Invalidity of the ordinance cannot be established by suggesting some other less burdensome procedure, which possibly might accomplish the end in view—honest delivery weights. The city may act with proper legislative discretion. Here there is nothing to show action so arbitrary, unreasonable, or discriminatory as to require us to overthrow its deliberate effort to meet a plain evil. (*Hauge* v. *Chicago*, 299 U. S. 387.)

The result of these court decisions has been to clarify the law and set a precedent in its enforcement which is a guide to city sealers throughout the Nation in defining their duties.

Of course, the contest waged by the city of Chicago had many complications, was protracted and hard fought. During the progress of litigation 119 cases were instituted by the city sealer and tried in the Municipal Court of Chicago and fines were assessed against all defendants. The mine owners attempted to sway public opinion and, being a closely knit group, affiliated with their local Chamber of Commerce, they succeeded in having it hold meetings and declare that Chicago had erected barriers to the free flow of goods to a competitive market; whereupon that Chamber of Commerce petitioned the Illinois Chamber of Commerce and the Chicago Association of Commerce to investigate what they called a "trade barrier." After a full hearing by both associations, each gave a vote of confidence to Chicago's Weights and Measures Department and declared the charge of the downstate Chamber of Commerce to be without foundation.

The mine owners also succeeded in releasing considerable publicity in the Chicago papers, as well as in the papers in the towns in the mining districts, much of which was adverse to the city sealer's office. This adverse publicity, it is hoped, has been dispelled by the pronouncements of the highest court of the State and the Supreme Court of the United States.

After the final decision of the Supreme Court of the United States had been handed down and its importance had traveled throughout the different States and cities, the city sealer's office was deluged with requests for copies of the ordinance, and many cities, facing problems in the trucking of merchandise, have adopted Chicago's ordinance.

The latest decision is from the Court of Appeals in Maryland, which upholds the validity of an ordinance of Baltimore, which adopted in part Chicago's ordinance.

In closing, may I emphasize again one of the most important points in connection with Chicago's ordinance, which is the requirement that the delivery ticket shall be delivered *before* any of the commodity is unloaded. This provision forces the seller to commit himself in advance as to his weights, and eliminates the possibility of excuses after he is caught, for the manifest reason that the weight must correspond with the weight on the ticket. Most States and cities have laws requiring only the delivery of the ticket, but not mentioning the

Digitized by Google

time at which it must be delivered. If the ticket is delivered after the coal is delivered, it is impractical to determine the weights. Again, the driver may have two tickets, one being correct for the load and the other calling for a ton more than is on the load. He can safely present the latter ticket if he is allowed to delay its delivery until after the coal is unloaded.

The ACTING CHAIRMAN. We are very thankful to Mr. O'Keefe for this paper. We can sympathize with him in the hard work that was necessary in the preparing of the cases and the hours of study that he must have devoted to the subject.

CONSUMERS' INTEREST IN ADEQUATE WEIGHTS AND MEASURES SUPERVISION

By D. E. MONTGOMERY, *Consumers' Counsel, Agricultural Adjustment Administration*

Mr. Chairman and members of the Conference, probably no people in America realize so fully the importance of adequate weights and measures supervision as do you who are gathered in this room. Probably no group *needs* to realize the importance of weights and measures supervision more thoroughly than does the group for which I appear as spokesman, the consumers of America. I suspect, however, that the group for which I speak knows far too little about weights and measures supervision and pays far too little attention to that subject. I suspect that if we could take a cross section of average American consumer opinion on this question we would find that consumers take it for granted that they should be protected in the weights and measures of things they buy, and because they take it for granted that this *should* be done they also take for granted that it is being done. We would probably find that in many districts consumers do not enjoy adequate safeguards and because of their indifference do not even appreciate their need for protection. In other districts we would find that consumers do have the benefit of good enforcement of a good law, but take that protection for granted like other governmental services and are not on the alert to see that it is kept up to the standards which people in your position know to be necessary and desirable.

The indifference with which too many consumers probably look upon weights and measures supervision is not surprising. For many years most of us have been rather indifferent about most of our consumer problems. Our tradition has been to make a lot of money and to spend it easily. Even millions of families who never made a lot of money and never found the spending of it easy, were subject to the influence of this general point of view and were discouraged from tackling their consumer problem sensibly. But if this is true of the past, it very positively is much less true today and it most certainly will not be true tomorrow. The American people are becoming consumers with amazing rapidity. That is to say they are becoming aware of their consumer problems and they are taking steps to do something about those problems.

As consumers we are interested in the kind of goods we buy, in the price we pay for them, and in the quantity of things we consume. At first this new consumer movement that is getting under way all over the country seems to be giving its major attention to quality. It wants facts which accurately describe the things consumers pay for, it wants to be sure they are getting their money's worth in terms of

Digitized by Google

real utility. The consumer movement is also interested in price. It is showing some disposition to do something collectively on the subject of price. If it is not equally aware of the necessity of being sure that when consumers purchase goods they get the quantity which they are paying for, then that indifference to the extent that it exists can only be due to the fact that consumers are taking something for granted. If the consumer movement is not getting behind you in demanding adequate weights and measures supervision, it is only because the need of doing so has not been sufficiently brought home to consumers. Perhaps the fault is yours and perhaps the fault belongs to people who like myself are trying to promote the cause of consumer education. We need not waste any time, you and I, dividing the blame. It is perfectly clear that consumers can be interested in weights and measures supervision and I think it is equally clear that once they are interested in it they will get it.

Consumers have an enormous stake in your profession and in your service. Latest available figures indicate an annual consumption in this Nation of 19 billion pounds of potatoes; of more than 21 billion pounds of meat, poultry, and eggs; of more than 27 billion pounds of fresh fruits and vegetables; of 15½ billion gallons of gasoline, of 445 million gallons of lubricating oil. All but a very small part of these enormous totals is measured out to the consumer in millions of small retail transactions across the counter. For at least two-thirds of the families who make those millions of purchases it is a question of vital importance that they get the quantity they pay for. A very minor average error against them in weight or measure could mount up to a national total of very real significance.

Only an insignificant fraction of the total amount of money involved in the transfer of this huge store of commodities to consumers would be required to adequately police the weights and measures aspect of these transactions. Mr. Ralph Smith, of the National Bureau of Standards, in an address which he gave before the League of Virginia Municipalities last September estimated that the average annual assessment for adequate weights and measures enforcement in Virginia would amount only to 30 cents per family. This, he shows, is the cost of 15 pounds of potatoes compared with the 770 pounds the family uses in a year, 1¼ pounds of meat compared with its 650 pounds total consumption, 2 gallons of gasoline out of 500, 1½ quarts of lubricating oil out of 14 gallons. And, remember, any one of these items would meet the whole cost. Certainly if shown these facts, consumers will not object to the expenditure of 15 pounds of potatoes to assure themselves fair weight on all the potatoes they buy in a year and on all the other things they buy by weight or measure during the year. If they average short weight by as little as ⅓ ounce on each pound of potatoes they buy, this item alone would cost them as much as the annual assessment for adequate weights and measures supervision on all the things they buy.

The reports of the recent National Conferences on Weights and Measures give ample testimony that alert weights and measures officials are giving more than an adequate return on the money invested in their departments. Going back to your 1929 meeting I find this rather startling statement made by Ernest N. Smith, General Manager of the American Automobile Association: "From a survey recently made by the American Automobile Association it was found

Digitized by Google

that the motoring public in the United States is being robbed by dishonest operators of retail gasoline pumps of a sum conservatively estimated at $20,000,000 annually."

This situation may have changed since then, but the chances are that there is still need for improvement. For example, I find in your 1936 Conference proceedings references to a check-up here in Washington on one chain of gasoline stations, which revealed that out of 36 purchases of 5 gallons each, short measure was given 23 times in amounts ranging from 6 ounces to 2 gallons. George M. Roberts, the Superintendent of Weights and Measures for the District of Columbia, estimated that this firm was defrauding Washington consumers approximately $100,000 per year. Items such as these should certainly arouse the interest of consumers in weights and measures supervision.

Another interesting story of short weighing comes to me from New York and involves the sale of dressed poultry. Consumers complained that they were being given short weight on dressed poultry at one particular store. A check of the scales used in this store indicated that they were satisfactory. After some careful sleuthing a weights and measures official found the source of the cheating. If a customer asked for a dressed chicken the clerk inserted a lead plug covered with fat into the chicken as he secured it from the cooler. After he had cleaned the chicken for the customer he recovered his lead plug and was ready to serve the next person. The bad situation which existed in poultry buying here in Washington was mentioned by Mr. Roberts at your Conference last year when he reported that 68 out of 81 purchases of poultry at one group of stores were short weight.

There is one paragraph of Mr. Roberts' address of last year in which I take particular interest as a spokesman for consumers. Said Mr. Roberts, "Credit for presenting to Congress the facts regarding the desperate need for an increased inspection force is due largely to the active chairman of our local consumers' council, who did very fine work." I am wondering if this comment does not suggest a line of endeavor in which the National Conference of Weights and Measures and the Consumers' Counsel Division might cooperate. The nature of these consumer organizations, it seems to me, makes them the logical spokesmen to demand stronger laws and more adequate appropriations for weights and measures departments.

I should like to call your attention to two developments along this line which I think hold great possibilities for bringing to the attention of consumers the importance of good weights and measures administration. The first of these is the rapid increase in consumer organization, and the second, the great strides that are taking place in the development of programs of consumer education.

At the present time consumers are financing three independent, nonprofit organizations to test and rate consumer goods. These organizations have a combined membership of approximately 100,000 individuals. Surely groups of people who see the importance of supporting agencies to give them the facts about commodities ought to be equally interested in seeing that they get the amount of goods for which they pay.

Last month the organizational work was completed for the Consumers' National Federation to act as a central clearing house for

Digitized by Google

organizations having an interest in consumer affairs. The program of this organization will, among other things, include educational work and an informational service.

Such groups are for the most part of very recent origin. I should like to call your attention to certain long-established organizations which have been giving special emphasis to consumer programs in their programs. The American Association of University Women distributes a large consumer study kit, and over three thousand of these have gone out to study groups. Some of the branches of this organization have held special consumer exhibits. The League of Women Voters has taken an active interest in consumer affairs. This organization has supported food and drug legislation and has issued for its membership such publications as "The Government and the Consumer", and "Research in the Consumers' Interest." The National Congress of Parents and Teachers has a committee which has been working on a 3-year program giving emphasis to consumer interests. One of the handbooks of this organization contains a chapter on the "Education of the Consumer." Thousands of other women are becoming consumer conscious through the program of the National Coat and Suit Recovery Board to promote their consumer-protection label, a label which assures the retail buyer that satisfactory labor standards have been met in the production of the article.

The American Home Economics Association with a membership of 12,000 teachers has always taken a deep interest in consumer welfare. The journal of this association has carried many articles on subjects of importance to the consumer. "The Consumer Education Newsletter" which the association issues monthly is an outstanding service to teachers in the field.

As a guide to the consumer education movement the Home Economics Education Service of the United States Office of Education has issued a 205-page bulletin entitled "Consumer Buying in the Educational Program for Homemaking." Over 9,000 copies of this bulletin have been distributed to educational leaders. The interest of the States in this program is indicated by such publications as "Suggestive Materials for Teaching Consumer Buying in the Secondary Schools" issued by the Home Economics Division of the University of Iowa; "Consumer Buyer Education—A Memorandum for Home Economics Teachers" by the Department of Education of the State of New Jersey; "Education for Consumption" by a committee of the Colorado Education Association and the "Report of Committee on Consumer Education" by the Home Economics Extension Service of Ohio State University.

In the field of business education interest in consumer problems is no less marked. In June 1934, the University of Chicago Conference on Business Education was devoted solely to the subject "Business Education and the Consumer." The National Education Association is holding its annual convention in Detroit the latter part of June and three-fourths of the program of the Social Business Section is given over to speakers on consumer education. In California the Home Economics and Business Education Divisions of the State Department of Education are cooperating to publish materials for a State-wide program of consumer education.

In Idaho and Wisconsin material is being distributed for adult consumer education on a State-wide basis. In Idaho the State De-

Digitized by Google

partment of Education, the Civilian Conservation Corps, and the Works Progress Administration, have set up a correspondence consumer course. In Wisconsin the Rural Sociology Division of the State Department of Agriculture has issued a guide for adult study entitled, "How Can the Buyer Get His Money's Worth?"

We get word of courses in consumer education being set up in many schools throughout the country. We know of nine colleges or universities which are teaching the economics of consumption, seven which are adding consumer buying courses, and four which give courses in the methods of consumer education. This does not include the large number of schools in which there are regular courses in home economics, and the subject of home economics, I understand, has very definitely stepped out of the kitchen and is going into the market place where consumer values are made. The Cooperative League recently reported that 18 American colleges are adding special courses in consumers' cooperation, and the subject is discussed in 131 other colleges. Here is a phase of the consumer movement which will do yeoman service for better weights and measures supervision.

I hope I have discussed consumer education at sufficient length to convince you that this development is not just a passing fad. Consumer education has become a solid part of our educational structure because it meets a fundamental need, and I am sure that it offers a splendid channel for spreading the gospel of better weights and measures supervision.

I think that the time has come to turn the full spotlight of attention on weights and measures departments as consumer-protection agencies. Teachers of consumer education need to have their attention called to the work of weights and measures departments. Consumer organizations that are on the lookout for practical projects need to be shown that weights and measures supervision represents a close-at-hand problem that will give good returns for the attention they give it. Consumer groups not only need to work to secure weights and measures supervision in States and communitities which do not have it, they need to work for adequate appropriations in all jurisdictions so that officials can have sufficient equipment and a staff of such size and training that they can do a thorough-going job.

The Consumers' Counsel Division for which I speak has made a small beginning in trying to arouse the interest of consumers in weights and measures supervision. The "Consumers' Guide," which now goes to 100,000 consumers, has carried several articles on this subject. Fairly recent ones are: "Checking Your Weights and Measures", and "Grocery Clerks Test Their Knowledge." The first of these is a general story on weights and measures administration and the second tells of a project carried on in Richmond, Va., to educate grocery clerks about weights and measures. I brought along a number of these issues of the "Consumers' Guide" so that you may have copies as you leave today's meeting.

Our division receives a continuing demand from consumer groups and teachers of consumer education for study outlines on consumer problems, and we have undertaken the production of such a series. I have in my hand a copy of the first one to come from the press. It is an attractively printed, well illustrated guide to study for school or adult groups. It lays out an entire program of reading, investigation, reporting, and tabulation of results on its particular subject, which

Digitized by Google

happens to be eggs. Our first principle in preparing these is to make them interesting, believing that if we succeed in that we will also make them instructive.

The proposition I should like to put to the members of the Conference is this: If, as Mr. Smith says, our chief difficulty is getting consumers and governmental officials to "fully appreciate conditions which actually exist, the consequent need of adequate weights and measures supervision, and the tremendous savings to the people which follow the establishment of such supervision", then we should include a consumer study guide titled "Consumers Look at Weights and Measures" in this series. It will help do just what Mr. Smith suggests.

If we are to tackle the job of preparing such a study guide the first thing to do is to find out as exactly as possible just what the weights and measures situation is in all parts of the country. We propose to do this by sending out a questionnaire on various phases of weights and measures administration, covering such items as the nature of your weights and measures law, the cost of your department, some examples of savings made for consumers, and general results of your enforcement activities. We will especially want to know of the methods you have found successful in publicizing your department, and the projects you have worked out for educational work in the public schools.

We would use the material gathered in this study in three ways. First, we would carry special articles in the "Consumers' Guide" telling what we find; second, we would use this information in the weekly radio broadcast which we give in cooperation with the National Federation of Women's Clubs over the red network of the National Broadcasting Co.; and third, we would prepare on the basis of what we find an attractive illustrated study guide for use by adult consumer groups and by classes in consumer education in the public schools.

I realize that the filling out of "another" questionnaire on your part is not an easy task. But if this plan will promote weights and measures supervision in places not now having it and will strengthen departments already in operation, it should be worth the trouble. If it is within your policy to take official action endorsing such a program, that will strengthen our position in asking weights and measures officials for the information, and, I am sure, will give us much better results.

I appreciate the opportunity to present this matter to the National Conference on Weights and Measures, and I want to invite you, without further invitation, to send stories of your enforcement activities and experiences to the "Consumers' Guide" and to make of that publication a clearing house for news on the consumer protection aspects of weights and measures administration.

MOTION ENDORSING PROGRAM OUTLINED ABOVE

The ACTING CHAIRMAN. We thank Mr. Montgomery for his splendid paper.

Mr. FULLER. Mr. Chairman, at the conclusion of Mr. Montgomery's address I feel that the members of the Conference should not only be willing but most anxious to endorse his suggestions, and if it is in order I would like to make the motion that we heartily are

Digitized by Google

in favor of his suggestions and are very glad to have the opportunity to cooperate with his program.

(The motion was seconded, the question was taken, and the motion was agreed to.)

The ACTING CHAIRMAN. We now come to a subject that is of vital interest to all of us; whether we agree or disagree with the speaker I am sure we will listen with a great deal of interest to what he proposes as a result of a year's study. We will hear J. H. Meek, of Virginia, speak on the "Proposed Federal Legislation in Relation to the Financing of Weights and Measures Inspections."

Mr. ROGERS. There are a number who have left for the day. I feel that this should be taken up at some meeting when all of the representatives of the States will be here to voice their opinions on it, or hear what it is all about. I would therefore like to move adjournment for the day.

Mr. CULLEN. I think that is a very good idea. There are a number of our people still to come from Pennsylvania and other States, I think, and for the benefit of all it will be better for Mr. Meek to postpone this until tomorrow or the next day. I second the motion put by Mr. Rogers.

The ACTING CHAIRMAN. The question of adjournment is never in order for discussion.

(At this point, at 4:30 p.m., the Conference adjourned to meet at 9:00 a. m., Wednesday, June 2, 1937.)

Digitized by Google

THIRD SESSION—MORNING OF WEDNESDAY, JUNE 2, 1937

(The Conference reassembled at 9:10 a. m., at the Raleigh Hotel, John P. McBride, Vice President of the Conference, in the chair.)

The ACTING CHAIRMAN. Gentlemen, we are ready to open the morning session, and the first business of the morning will be announcements by the Secretary, Mr. Holbrook.

Mr. HOLBROOK. I have to advise the delegates that the report of the Committee on Specifications and Tolerances is now ready for distribution. A supply of copies of this report is on my table. Each delegate will doubtless desire to take away a copy so that he may familiarize himself with the proposals and be prepared to dispose of them when they come up for consideration on Friday morning.

GENERAL CONSIDERATION OF SUBJECTS OF INTEREST AND QUESTIONS BROUGHT UP FOR DISCUSSION BY OFFICIALS

Mr. SWEENEY. I would like to open up as a matter of discussion the question as to having pump manufacturers make some provision for the proper sealing of pumps.

The ACTING CHAIRMAN. Mr. Sweeney invites discussion on the question of the pump manufacturers providing some uniform place on the device for sealing.

Mr. DAVIS. I would like to have this suggestion included also. We have no place to attach a "Condemned" tag to a person weigher or to some of these new measuring pumps, and if it could be arranged so that there could be a hole drilled for this purpose, it would help. On some it can be done, but on others there is no way, and in our State the person weighers are more of a joke than anything else. They are fortune telling machines, but at the same time we are supposed to check them like any other scales. They take the people's money. When we condemn one of those scales we have to hand the tag to the person who operates the person weigher and very often we never get the tag back, because it is destroyed or lost. If the manufacturers would design equipment so that we might attach either a seal or a condemned tag to the person weigher or pump, that is what we need. The gummed seal will come off under some weather conditions.

The ACTING CHAIRMAN. I think, Mr. Davis, that the last Conference provided for holes in the slot on person weighers so that the "Condemned" tag could be attached there and thus prevent the insertion of a coin. There is no special provision in regard to means for attaching a seal.

Mr. TINKEY. Ohio goes a little further and provides for the attachment of a lead and wire seal. I think that could be included. Perhaps if that were made general they would all comply with it.

The ACTING CHAIRMAN. I think that is in the mind of at least one of the manufacturers—a uniform position for seals.

Mr. ISING. When you seal them the seal doesn't prevent changes in adjustment. Do most States have a ruling that the weights

Digitized by Google

and measures inspectors will seal such apparatus at the adjustment point?

The ACTING CHAIRMAN. There is always means for effectively sealing at points of adjustment, but I think this matter had to do with the seal that appears to the public.

Mr. JENSEN. We have just received 6,000 metal seals, 4 by 5 inches in size, on which is the word "Approved," and the part of the law applicable, stamped into the metal. The plate is finished in three different colors, and is fastened on the pump with four metal screws. Whenever a pump is condemned we remove that tag and attach the red "Condemned" tag until the pump has been repaired and we have retested it. If we approve it then we remove the "Condemned" card and put the seal back on.

Mr. TOLAN. I happen to be from Fort Wayne, the pump city. One company is coming into line with a provision for the wire seal and others will probably do likewise. That is being taken care of now.

Mr. WARNER. On scales of the large capacity type the beam rod in a great many cases is not covered and we have found in a number of cases that an unscrupulous party can easily put a foot against this rod and cheat in very fine shape. In other cases, stuff is piled inadvertently against that rod and this causes great discrepancies. My suggestion would be that we have something in the regulations to the effect that this beam rod has to be boxed up or closed in.

Mr. PELLEGRINI. I have had a similar experience in Parkersburg, W. Va., on that particular type of scale. We have noticed the weighmaster with his foot touching the beam rod, and of course we ordered it to be boxed. Since this condition has been corrected farmers or merchants who had previously complained of short weights on cattle have no longer made the same complaints.

Mr. DAVIS. I would like to ask the delegates if they have experienced cases in which the nozzle on a gasoline pump designed to prevent the drainage of the hose, has been changed. It was brought to my attention in several instances that the inspector would pass a pump, the nozzle being correct in every respect; after the inspector had left the operator of that pump would change the nozzle so that the hose could be drained. They were then draining those hoses and helping themselves to as much gasoline as the hose would hold.

Mr. BULSON. I have had the same experience. Recently we inspected a pump; on a return trip a few days ago we found that condition and I promptly condemned it. The penalty is $25 or 25 days. I told the man, "If I come back here again and find this condition, you are going to court." I haven't had any more trouble. A pump that won't stay right while you aren't looking isn't any good.

Mr. BOYLE. At this time I would like some discussion on the so-called household gravity-flow fuel meter. As I understand it, there are a number of those meters in use. Some States have tolerated them but have not approved them or sealed them. There has been no legal tolerance established in a number of places where they are being used, but where a tolerance has been established it ranges all the way from 3 to 7 cubic inches on 5 gallons.

In Maine the State Department has not yet established a tolerance. They have permitted me to seal the meters if the error does not exceed 1 cubic inch per gallon. The problem of testing is not as complicated as it might appear for the reason that in Portland we require the

Digitized by Google

distributor to provide a supply tank with proper piping, also burner tips of 3-, 6-, and 9-gallon per hour capacity, and the meters are tested in the condition under which they are used. After they are tested they are taken to the various homes and the fuel that is used by the purchaser is sold on the basis of the meter reading, disregarding the meter reading on the tank truck.

The point that I want to bring out is that before another year comes around I am led to believe they will be used in much larger numbers than they are now. It is something that is coming and something I think the Conference should recognize, and on which it should establish some uniform tolerances.

If any of the delegates here have had any experience in testing these meters I would like to know what that experience has been.

The ACTING CHAIRMAN. Mr. Boyle, of Portland, brings up for discussion the so-called household fuel meter. I think a year ago or 2 years ago there was a gentleman here with such a meter; it is one that is installed between the tank in the cellar and the oil burner, and is of the gravity-flow type.

I think I will leave that subject in your minds so that when we again come back to this open forum we can open up with that subject, but at this time, gentlemen, I think we will proceed to the item at which we adjourned yesterday afternoon, as most of the delegates are now here.

PROPOSED FEDERAL LEGISLATION IN RELATION TO THE FINANCING OF WEIGHTS AND MEASURES INSPECTIONS

By J. H. MEEK, *Director, Division of Markets, State of Virginia*

I will make a brief statement relating to the bill "To provide assistance for the several States, Territories, and possessions in the inspection and regulation of, and the administration of laws concerning weights and measures and weighing and measuring devices and mechanisms."

Weights and measures activity is one of the most vital public needs. It is not a new activity. Throughout many years it has received only meager support in most sections of this country. Since there has been but little Federal legislation relating to weights and measures, numerous inconsistencies and irregularities in laws and specifications, tolerances, and regulations exist between the States. These can easily be made more uniform and more workable, and they can be more economically and efficiently administered through Federal legislation coordinating and supporting them.

Weights and measures activity in this country may be described in general terms as follows: One-fourth of the States in the Union have considerable activity relating to weights and measures, one-fourth of them have about 50 percent of the activity that is urgently needed, while one-fourth have only a little activity, and the other one-fourth have practically no activity. This is a serious situation and a strong indictment against public officials responsible for this negligence.

Experience shows that where there is no activity on weights and measures, approximately 50 percent of the weighing and measuring devices used by dealers in selling to the public fail to meet reasonable standard requirements. The larger portion of these are short weighing and short measuring the public, while the remaining portion of the

Digitized by Google

50 percent that do not meet reasonable standard requirements have defects leading to inaccuracies which in most cases will defraud or take advantage of the public.

When Congress is spending gigantic sums to help the under-privileged, it certainly seems that there should be some interest in encouraging and helping the States and local municipalities in their efforts to protect the public in this important service, which can only be satisfactorily financed from public funds. Congress has been almost totally inactive for many years on weights and measures matters, therefore, it seems that it is time for some review of the existing needs, and action to help the States and municipalities in the correction and improvement of undesirable and deplorable conditions that now exist throughout the greater part of this country.

The purpose of this bill may be summed up in four words—"Larger and improved service." This can and will be secured, first by bringing about greater uniformity throughout the country, and second by giving support and encouragement to the States in developing and maintaining uniform and efficient service.

I have prepared only this short statement with the hope that plenty of time might be given for representatives from each State to make a statement at this time as to what they think of the matter as a whole. The bill has been revised twice, the last copy having been mailed a few days ago to each person in charge of weights and measures within the different States. Some did not receive them before leaving home for this Conference, and some have had them forwarded here.

If it is the desire of the Conference I will read this bill, which is now being distributed. May I ask all who would like the bill to be read to hold up their hands, please? [A number of delegates raised their hands.] Then, Mr. Chairman, I will take time to read the bill.

A BILL

To provide assistance for the several States, Territories, and possessions in the inspection and regulation of, and the administration of laws concerning, weights and measures and weighing and measuring devices and mechanisms.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. As used in this act, unless the context clearly requires otherwise:

(*a*) "State" includes, in addition to the States of the United States, Alaska, Hawaii, Puerto Rico, and the District of Columbia;

(*b*) "Weights and measures" shall include all weights and measures and weighing and measuring devices and mechanisms, and all devices or mechanisms designed or intended to be attached thereto and used in connection therewith;

(*c*) The term "use in trade or commerce" shall be construed to include use in buying or selling goods, wares, or merchandise, or in barter or exchange; in determining charges for the carriage or transportation of freight, baggage, or express shipments; in determining wages, compensation, or charges according to the amount of goods or things made or produced, or amount of work or labor done or services performed; in compounding medicinal and other formulas individually submitted for this purpose; in determining weight or measure when a charge is made for the determination; and in all other similar cases;

(*d*) "The National Conference on Weights and Measures" refers to the organization of this name which is held under the auspices of the National Bureau of Standards and which is composed of officials of the National Bureau of Standards, of officials of State and local jurisdictions charged with the duty of enforcement of weights and measures laws and ordinances, and of such other persons as may be designated as delegates by the Governor of a State.

SEC. 2. (*a*) For the purpose of assisting the States in the administration of their laws concerning weights and measures there is hereby authorized to be appropriated for the fiscal year ending June 30, 1938, the sum of $800,000, and for each fiscal year thereafter such sums as may be necessary, to be used as hereinafter provided in this act.

Digitized by Google

(*b*) For the purpose of administering the provisions of this act there is hereby authorized to be appropriated to the National Bureau of Standards for the fiscal year ending June 30, 1938, and for each fiscal year thereafter, such sums as may be necessary.

SEC. 3. (*a*) The administration of this act by the Secretary of Commerce shall be through the National Bureau of Standards.

(*b*) The Secretary of Commerce shall certify to the Secretary of the Treasury quarterly for payment to each State amounts to be expended for the administration of the weights and measures law during the fiscal year for which such payment is to be made. These amounts shall be apportioned on the basis of the populations of the States qualifying under this act; but in no case shall the amount certified and paid to any State in any year be in excess of the amount appropriated and expended by the State, including its subdivisions, for the same purpose during that year, and the total amount certified and paid under this section to the several States in any fiscal year shall not exceed the amount appropriated by Congress therefor for such fiscal year.

(*c*) Out of the sums appropriated therefor, the Secretary of the Treasury shall upon receiving a certification under subsection (*b*) of this section pay, through the Division of Disbursement of the Treasury Department, to the State agency charged with the administration of such law the amount so certified.

(*d*) The Secretary of Commerce shall make no certification for payment to any State under the provisions of this act, unless he finds that such State is effectively enforcing or prepared to enforce:

(1) A law for inspection of weights and measures in the State.

(2) Rules and regulations, to require the sale of commodities by weight or measure or to govern the manner of sale of commodities by weight or measure, and to include specifications, tolerances, and regulations to govern the design and construction, accuracy, and use of weights and measures for use in trade or commerce.

SEC. 4. (*a*) The rules and regulations including specifications and tolerances relating to weights and measures for use in trade or commerce, mentioned in section 3 (*d*) (2), shall be those which are adopted by the National Conference on Weights and Measures when voted upon in the manner set out hereinafter and which are thereafter published and recommended by the National Bureau of Standards for adoption by the several States.

(*b*) The conference shall meet at least once each year for the purpose of discussing weights and measures and the adoption of rules and regulations, including specifications and tolerances, relating to weights and measures. Voting in the conference shall be by States, each State being entitled to a minimum of three votes, and to one additional vote for each one million inhabitants by which its population exceeds three million. The population of each State shall, for the purposes of this subsection, be deemed to be that million nearest its actual population. The officials of the Weights and Measures Division of the National Bureau of Standards shall be entitled to three votes.

SEC. 5. Each State receiving aid under the provisions of this act shall make an annual report to the Secretary of Commerce on such forms as may be provided, relating to activities carried on by and with the aid of funds received pursuant to the provisions of this act.

SEC. 6. If any provision of this act, or the application thereof to any person or circumstance, is held invalid, the remainder of this act and the application of such provision to other persons or circumstances shall not be affected thereby.

I am deeply indebted and very grateful for the suggestions that have come to me through the mail from you and others, particularly W. R. Shands, who is the Director of the Legislative Reference Bureau of my State, without whose help it would have been impossible to have drawn this bill up in the form in which it has been proposed.

As mentioned, two revisions have been made and there are no doubt technical problems that can be taken care of better than in the bill as written. I think it is the duty of everyone to make suggestions for such changes as they think will help the country as a whole, and those of us who have been interested, myself particularly, welcome such suggestions.

Some suggestions were given to me last night. One is, that in section 3 (*d*) the word "effectively" be stricken out and that the

Digitized by Google

word "prepared", be changed to "preparing"; also that in section 3 (*d*) (2) the words "design and construction" be stricken out and that the following words be added: "*Provided, however*, That each State shall have the right to make additional rules and regulations not in conflict with said rules and regulations." This provision was in one of the former drafts but was left out without any intention so to do.

DISCUSSION OF ABOVE SUBJECT

Mr. J. H. MEEK. Mr. Chairman, I have tried to be short in discussing this and I would like to have further time if the discussion indicates it is necessary to say more, but at this time I am going to ask if it be your pleasure to let each State have a 1-minute statement, at least, as to what their attitude is on this matter.

The ACTING CHAIRMAN. That would be for the body to determine. The query that Mr. Meek makes is whether or not the States should be polled as to their attitude in relation to this proposed legislation. The Chair doesn't wish to do that unless somebody from the floor makes a motion to do so.

Mr. GRIFFITH. In order to get this matter before the body properly and find out the consensus of opinion before we go into any lengthy discussion, I would suggest that the States be polled as to whether or not they are favorable to a bill; if they are, we can take up this one. If there is no response favorable to the enactment of such legislation there is no need of going into discussion of any bill.

Mr. O'KEEFE. I don't think we should just poll the States. I think each individual should be given a few minutes to say why he is for or against a bill. I don't feel like just sitting here and saying "yes" or "no" without giving certain reasons.

Mr. RAGLAND. I move that the bill be approved by the Conference, with the understanding that this is the proper way to handle it. I am not in full sympathy with the bill and will suggest, at the proper time, an amendment, in case the Conference discusses the bill.

Mr. BAUCOM. I don't naturally go against my friend Mr. Ragland, but I going to make a substitute motion that a committee of, say, five men be appointed to study this thing over and to report back their recommendations on Friday morning or at such future time as the Chair may set. Let's hear from them at that time and then give the delegates time to express themselves. This proposal does have some merit. There are some phases of which I am not in favor, but I would not want to hamper or prevent some of the States from getting aid if it can be done in a good way.

Mr. RAGLAND. I second the motion.

You didn't state when this should be reported back. I call attention to the fact that if it is not reported back at the proper time, it is a dead bill. If you are going to refer it to the next Conference you are killing it.

Mr. ROLLIN E. MEEK. It appears to me that this proposed committee could operate more effectively if they had some consensus of opinion from the various States as to the changes which should be made in the bill. They will have to work in the dark otherwise. Why not have a roll call, or continue as you started and get suggestions, and then permit the committee to act?

The ACTING CHAIRMAN. At the present time we have a motion duly made and seconded that a committee of five be appointed to sit on

Digitized by Google

this matter and report back on Friday morning. Mr. Meek offers the suggestion that some discussion occur in relation to the question so that in the event the motion of Mr. Baucom prevails the committee will have something on which to work besides their own thoughts. The floor is open for a discussion by the delegates. In relation to the idea of polling the States, I would not take upon myself the responsibility of asking the delegates of the various States to give a "yes" or "no" on the thing.

Mr. LEVITT. Mr. McBride, in discussing this bill there are several things to be taken into consideration. Primarily the purpose of the bill seems very good, but I doubt very seriously that any weight and measure official of any State would have the authority to usurp the powers of the Governor or other officials in saying that his State would tie into a proposition of this kind. This is a proposition that I, personally, would have to take up with the Governor, and have his sanction and approval before I would say that our State was in favor of this.

Another thing: We are operating under a fee system and we do not intend to change that fee system. If we accept Federal aid in the enforcement of weights and measures work in our State they probably would have a definite standard that they would wish to follow and that might not work out.

Personally, I would like to have a little time to study this thing over.

The ACTING CHAIRMAN. Gentlemen, as I understand it, this is not yet in Congress, but is contemplated for immediate introduction. Is that correct, Mr. Meek?

Mr. J. H. MEEK. Mr. Chairman, the matter is rather left in the hands of this Conference. If the Conference sees fit, I see no reason why it cannot be introduced without delay.

The ACTING CHAIRMAN. Have in mind, then, gentlemen, that this is not legislation already petitioned for, but contemplated as this Conference may determine, which makes the matter of your authority to act for your various States, of some importance.

Mr. ROGERS. This is a very serious proposition; there isn't any doubt about that. I think Mr. Meek is to be commended for his fundamental thought of advancing weights and measures uniformity and efficiency throughout the country. However, in reading over this bill I find there are things that must be taken into consideration in connection with it.

First of all, the bill doesn't seem to grant any discretionary powers to the States as to whether or not they will adopt this. It merely flatly says that if they qualify they get this money and may use it by reporting to the Federal Government. There may be some States now financing their own propositions that may not care to go into it, possibly with a fear or thought that they may be subject to Federal control. You are reaching into a question of State sovereignty and State's rights, which is a very moot question.

Voting power is brought into this proposed Act, where you tie up the National Conference on Weights and Measures directly as an agency or as a branch of the Federal Government. I don't know whether you can do that or not. This is an educational body, we have always understood, in cooperation with the National Bureau of Standards. It is suggested that the States be allotted so many votes. I don't

Digitized by Google

know how that is going to be taken by the members of the Conference. I think some years ago, possibly at the beginning of the Conference, there was one vote to a State. If you are going to do that, it might be well and good but you still must consider that there are county and municipal officials who come here at the expense of their local governments, who take a very deep interest in what is going on, who come here to learn; they feel they are entitled to a voice in the Conference, and their voice is important. This voice has been accorded them by custom. I don't think the framers of the bill had any purpose in mind of taking that power away from the States. It may bring certain delegations down here because of their interest in the work.

There is another feature of this thing—its economic side. This apportionment of this money is important. Take New Jersey, for instance. We operate on between $40,000 and $50,000 up there. Under this bill we would be entitled, I suppose, to $40,000 or $50,000 from the Federal Government. Now here is what is going to happen: The minute the State appropriations committee finds out that the Federal Government is going to match the appropriation of the State of New Jersey they are going to say, "Well, you can operate on about $40,000, so we will give you $20,000 and let the Federal Government give you $20,000." This bill predicates that you will get dollar for dollar; the State will put up a dollar and the Federal Government will put up a dollar. That means that the governments of the States, for economic reasons, are going to cut their appropriations in half and the State departments will be no better off than they were in the beginning.

I haven't much more to say on the bill but I do believe it would be a good idea to dispose of it here, one way or the other. As Mr. Levitt aptly says, we certainly would not want to commit our State to a proposition of this kind without finding what the Governor and the legislative body think about it, because after all we are not empowered to talk for the government in that capacity.

We have with us here our Mr. Walsh, Assistant Attorney General, assigned to the enforcement of weights and measures laws in New Jersey. We thought this bill was of sufficient importance for him to be here just in the case we needed legal advice on it. A question of constitutionality may be involved. I would like to hear him say a few words on this, if he may have the privilege of the floor.

The ACTING CHAIRMAN. If there is no objection we will accord the floor to the Assistant Attorney General of New Jersey.

Mr. WALSH. Mr. Chairman: When I came down here yesterday I saw this bill for the first time. Joe Rogers has been talking about constitutional features and he has me on the defensive, so I was glad to hear the suggestion that each State would only talk approximately a minute.

I don't know whether I speak only my own personal objections, but I think I speak the objections of the various States which have weights and measures enforcement agencies. The Constitution, of course, provides for the setting up of a uniform standard and that is all. There are no decisions on how far the Federal Government can go under that provision, and I suppose there would be some conflict with the clause in the Constitution that reserves to the States their police powers. That is what weights and measures enforcement really is; it is one of the State's police powers, and that applies

Digitized by Google

even to legislation in the way of grants. This type of legislation by the Federal Government is cooperation, the Federal Government acting as a cooperative agency.

Grants have always been opposed, and legislation of that kind has always been defeated. It was defeated when they attempted to set up a department of education. The States stepped in and said the Federal Government should not have a thing to do with it. If they want to cooperate with the States in education, that is all right.

The appropriation made is very small, insignificant, but the argument has always been that that is an opening wedge. I think the purpose of the bill is defeated because the obvious intention of the draftsman is to provide better enforcement in backward sections, yet those sections have been unable to set up any departments or any offices to cope with the situations and they have no statutes on their books. Perhaps they have no interest in it whatever or perhaps they can't afford it, but if they can't set that up now I don't see how they can set it up later, because they will have to have money; the Federal Government won't grant money until the jurisdiction appropriates sufficient money to set up its enforcement agency.

There may be a very good intention back of the bill but it tends to put into the Federal Government's hands powers which essentially belong to the States. It always starts off this way, in a very small way, and gradually you have such interference with your State officials that there is a situation that is intolerable.

As Mr. Rogers said, you always have your men back home; especially during these times, when some of the men are looking for sources of revenue, they will say, "Here is where we can save $20,000", and the first thing you know they have cut your appropriation. Then, too, if the Federal Government is going to spend the money, they are going to have something to say about the way it is spent. I think there is one provision in the bill that is very broad in that respect and it means that the Federal Government is going into a sphere of activity which was never intended for it.

If there is anything to be done I think it is in the matter of education. That is what I think has always been done at this Conference, from what Mr. Rogers tells me, and I think that that should be adhered to in the future.

That is all I have to say. I don't like to interfere with the activities of your body, but Mr. Rogers and the State Department of Weights and Measures have been very interested in this. He asked me to come down, not only on this matter but on several other matters. I hope I haven't trod on anyone's toes in expressing my views.

Mr. ENGLEHARDT. I want to make an amendment to the motion that if a committee is appointed, it hold open sessions and any delegate who sees fit may appear before it; then let the committee bring in a bill to please the States, and we will approve or disapprove it on Friday morning.

Mr. BAUCOM. I am glad to accept that amendment to my motion.

Mr. GRIFFITH. I listened to Mr. Walsh's remarks with a great deal of interest. The power to control weights and measures supervision, or any activity pertaining to weights and measures, is already reposed in the Federal Government by the Constitution of the United States. They can do that tomorrow—tell every State what the standard should be in regard to weights and measures. I think

Digitized by Google

probably he failed to remember that, because that provision has never been exercised to a finality. There have been several feeble attempts, and just about 6 or 8 years ago Representative Perkins, who was then chairman of the House Committee on Coinage, Weights, and Measures, spoke before this Conference, and discussed one of them.

The idea behind this bill is to promote a wider and a more comprehensive administration of weights and measures supervision, so that many States that now do not have departments may avail themselves of Federal assistance in the form of funds which may be appropriated under this bill.

No State would be obligated to avail itself of this opportunity if it did not so desire. You will remember that in very recent Federal legislation—Grants to States for old-age assistance—States may participate if they want to by passing an enabling act. In that event they can then retain 90 percent of the amount collected in the State and pay to the Federal Government only 10 percent. The provisions of that act are similar to those of this bill. The fact that we are offered dollar for dollar would not diminish the amount available for our work. Suppose we are getting $40,000 now and the Government gives us $20,000; even if our State says, "If you are going to get $20,000 from the Government we will give you only $20,000", we still have the same amount and we won't hurt our present operations. Certainly there would be an opportunity to increase your appropriation, and you won't diminish it in any event.

Those States that don't have anything at all would certainly then have an entering wedge. The people would say to their own administrations, "Here, give us something. Let us get organized in the State and create supervision that is most needed. The Federal Government will help to the amount that the State appropriates." I know from my own personal experience that some 8 or 10 years ago Governor Ritchie said, "There isn't any demand for it and while I am in favor of it, I would hate to appropriate $60,000 to start." That included the buying of new equipment, which would not have to be done afterwards, but he said, "To saddle $60,000 more on Maryland yearly, would be objectionable when there isn't any great demand for it yet." If I had been able then to say, "If you will give us $30,000, the Federal Government will give us $30,000", we probably would have had a State department.

The bill offers an opportunity to get some of the Federal funds which are being spread about; the bill is certainly sound. As to the details, they are a matter of discussion and opinion. I read the bill over thoroughly for the first time the day before I came over here, and there are a number of objections that I can see. I hope the committee will take into consideration all the phases that have been put forth by Mr. Walsh, especially. His legal knowledge is very valuable, but I am quite sure that the delegates here from the several jurisdictions would not be binding their States if they voted favorably or unfavorably. After all, we are sent here because of our knowledge of weights and measures, to represent the various States and communities and to decide what we think is best for ourselves in the administration of weights and measures.

Mr. KLOCKER. I wonder if the committee could look up and determine whether or not this bill can be passed. I will tell you why. About 4 years ago they had a piece of legislation in the Congress to

Digitized by Google

double the State police departments of the country. I believe the States were to pay $1 of the salary and the Federal Government would pay the rest of the salary, in order to get more law enforcement. That bill was killed, or something happened to it, because the outcome of it was the "G-Man" school that the Federal Government is now running. I wonder if the difficulties that were run into on that bill would be run into on this one. I think it would be a good idea if the committee would check and see what happened to the other bill.

Mr. O'KEEFE. Before this motion is put I would like to have a ruling from the chair as to who is going to vote. I have been coming down here for 3 years as a member of this Conference. I am representing 3,500,000 people in the city of Chicago—as many people as some of the States. I think I am entitled to a vote here just as well as a representative of any of the States.

The ACTING CHAIRMAN. The chair will rule that the persons entitled to vote are the duly accredited delegates, whether they be from city or State. The provision in the proposed legislation would make a change but so far as the Conference as at present constituted is concerned, any accredited delegate may vote.

Mr. WARNER. I wish to offer a substitute motion number two, that the Conference resolve itself into a committee of the whole on Friday morning to further consider this matter.

Mr. GRIFFITH. I second that motion, Mr. Chairman.

Mr. BAUCOM. I will withdraw my motion in favor of that motion.

The ACTING CHAIRMAN. Mr. Warner, of Wisconsin, moves that the body constitute itself a committee of the whole to further consider this matter on Friday morning.

Mr. CRAWFORD. I want to urge you to vote against this for one reason. This Conference has a great deal of work to take care of. We are not on schedule at the present time; we are late. The committee in session can be visited by every one of us, and I believe that if that matter is taken on the floor and this Conference handles it as a committee of the whole, we will find our program too badly delayed.

Mr. J. H. MEEK. Mr. Chairman, as I stated, I would like to have a few moments for further remarks, and if I am given that time after this vote I will wait until after the vote. If not, I would like to say a few words in answer to some of the remarks that have been made here.

The ACTING CHAIRMAN. If this vote determines that the matter is postponed until Friday, your remarks would be in order on Friday.

Mr. J. H. MEEK. May I say a word at this time on the matter?

(The question was called for.)

The ACTING CHAIRMAN. The question is called and we are ready for the vote, Mr. Meek.

The motion now for action is Mr. Warner's substitute motion that the Conference constitute itself a committee of the whole to consider this subject further on Friday morning.

Mr. ROLLIN MEEK. May I ask Mr. Warner if he will consider having this meeting one night this week, either tonight or tomorrow night? Otherwise it will entirely break up the meeting. [Cries of "no."]

14465—38——4

Digitized by Google

Mr. ROGERS. I think we have everyone here, and a committee of the whole on Friday would be the same group, with possibly fewer men. Much of what has been said this morning may be lost sight of by that time and we will have to go over the ground again. I think we should dispose of this question one way or the other right here.

Mr. CULLEN. I quite agree with my friend Joe Rogers. It should be disposed of now. Friday is the last day we have and each of us wants to get out of here, and get out early.

The ACTING CHAIRMAN. The question is on Mr. Warner's substitute motion. Mr. Baucom withdrew his original motion, as I understand it.

Mr. BAUCOM. I am not withdrawing it if they want it that way.

The ACTING CHAIRMAN. Very well; then we have two amendments to your motion.

Mr. O'KEEFE. We came here, most of us, not knowing a thing about this bill or having read it or seen it. I move you as a substitute for the whole that this bill be made a part of the record and be printed in the proceedings of the Conference.

(The substitute was not seconded.)

The ACTING CHAIRMAN. Since Mr. O'Keefe's substitute motion has not been seconded, we will vote on Mr. Warner's amendment that we consider the matter on Friday.

(The question was taken and the amendment to the motion was lost.)

The ACTING CHAIRMAN. Now we have Mr. Engelhardt's amendment that the committee hold open hearings and report back this bill or some other bill at a date set before the termination of the Conference.

(The question was taken and the amendment to the motion was lost.)

The ACTING CHAIRMAN. Now we have Mr. Baucom's original motion, that the chair appoint a committee of five, the committee to sit on the matter and report back at a date set.

(The question was taken and the motion was lost.)

Mr. ENGELHARDT. To bring the matter to a head and dispose of it at this session rather than to prolong it and disrupt the workings of the Conference, even though I am not in favor of it, I move that the bill as read be adopted.

Mr. CULLEN. I second the motion.

Mr. GRIFFITH. If the idea is good we should take some action on it. It would be very detrimental to the esprit de corps if this thing is not discussed thoroughly. I don't want it ignored by a body of men vitally concerned with this question.

The ACTING CHAIRMAN. The motion is that the Conference adopt the proposed legislation as read by Mr. Meek this morning.

(The question was taken and the motion was lost.)

The ACTING CHAIRMAN. Gentlemen, we have with us a guest, the Hon. Harry Sauthoff, Member of Congress from the State of Wisconsin. Congressman Sauthoff requests the privilege of the floor for a short time to discuss H. R. 6964, which is a bill introduced by the Congressman in relation to fixing the standards of dimension and capacity for metal containers for canned fruits and vegetables and canned milk for the prevention of fraud. Congressman Sauthoff.

Digitized by Google

REMARKS OF HON. HARRY SAUTHOFF, MEMBER OF CONGRESS, SECOND DISTRICT, WISCONSIN

Mr. Chairman, ladies, and gentlemen of the Conference: I introduced H. R. 6964 for the specific purpose of securing some simplification in our standard sizes for metal containers for fruits, vegetables, and milk. This exhibit here of my fellow townsman, George Warner, is a silent but potent argument in favor of that bill. That bill does not seek in any way to hamstring or obstruct legitimate business, but I am strongly in favor of passing some legislation to outlaw the business of that particular public nuisance, the business pirate who seeks to defraud the consumer. Unfair trade practices are a menace to legitimate business and in no way can they be considered helpful, either to the consumer or to business.

When you introduce a bill of this character you meet with certain difficulties. One is to get a hearing on the bill, which is always extremely doubtful. Congress introduces about 22,000 bills during the course of a session and only about one-tenth of them get a hearing. Naturally the bill will be referred to the economists of the Department of Agriculture for their opinion first, before the chairman of the committee does anything about it. I have met that little difficulty by having the economists sit in and help draft this bill. So much for that end of it.

The second obstacle is to get by the Director of the Budget, for his first question is, "Does it cost anything and, if so, how much?" When you say it does, he puts thumbs down on it. This bill doesn't cost anything.

George Warner tells me there are probably 75 different sized cans now in the field. The housewife can't possibly keep track of all those cans. The result is that the chiseler and the grafter and the gouger have an advantage. We want to take that advantage away from them and put them on a par with legitimate business.

You men who are in this field know a lot more about it than I do and must recognize the difficulties that the housewife must have, because even you inspectors don't know the sizes of all the cans and what they hold. I realize that I don't know very much about it, but I find that even manufacturers don't know a whole lot about it, except that portion that pertains to their particular industry.

I sat in at a dinner the other day with a group of gentlemen who are interested in this bill—fine fellows, legitimate business men. They are in favor of simplifying the metal containers. We talked about the manufacturers' angle, we talked about the wholesalers' angle; then I said, "Well, now, gentlemen, you have discussed the manufacturer and the wholesaler. This bill isn't drawn for their benefit. It is drawn for the benefit of the consumer. What have you got to say about him?" He pays the freight. He pays your salary and he pays my salary, and he pays us to take care of him. I conceive that to be our duty. I would appreciate it greatly if you would send me any suggestions you have in regard to the measure, because after all, it is only by cooperation that we can possibly accomplish something in this field.

Thank you very much, Mr. Chairman.

Digitized by Google

STANDARDIZATION OF PACKAGES OF CANNED FOODS

By GEORGE WARNER, *Chief Inspector of Weights and Measures, State of Wisconsin*

I really enjoy presenting this particular subject because the exhibit speaks for itself, and in more forceful terms than anything that I can say. I do wish, however, to point out a number of inconsistencies that I believe you will agree with me are nothing short of ingenuity to deceive the purchaser.

The National Canners' Association is about the only agency that attempts to standardize packages for canned foods, and I wish to state that the Division of Simplified Practice of National Bureau of Standards has done some wonderful work in cooperation with the Canners' Association in attempting to standardize cans, but going at it by merely suggesting certain sizes to be used without having any law back of them has been an extremely difficult task.

I believe that in 1934 the National Canners' Association selected a simplified list of 27 sizes for approval by the industries and these were recommended as standards. I believe that this year the committee recommends a revised list of 21 sizes. However, there is nothing to prevent anyone from using any number of sizes that he sees fit, and the result is that instead of the number of sizes in actual use being decreased, it is apparently increasing. I have positive proof that there are at least 52 sizes in use, as I have that number of cans in my exhibit, and with the exception of one or two, these cans are being used at the present time, and I know that I have missed quite a number, so that my estimate would be that there are close to 75 different sized cans now being used in the sale of canned foods.

As far as the National Canners' catalog of specifications is concerned, the trade names are not of any value at all to the purchasing public. In my exhibit there are 22 cans that are in conformity to the National Canners' specifications, and 30 that are not.

Trade names for cans.—At the present time the trade designations for cans that are recognized by the National Canners' Association are something like this:

5–Z; 6–Z; 8Z short; 8Z tall; no. 1 picnic; 211 cylinder; 300; no. 1 short; no. 1 tall; no. 303; no. 303 cylinder; no. 1 flat; no. 2 special; no. 2; no. 2 cylinder; no. 1¼; no. 2½; no. 3; no. 10; no. 1 square; and no. 2½ square.

There is no argument about the fact that the particular designations that I have just read do not mean anything to the purchaser. In a recent weights and measures school where nearly all of the participants were active weights and measures officials, I asked for an answer in writing to three questions:

Question 1.—Are you familiar with the trade designations for fruit and vegetable cans?
Question 2.—Name the trade designation of three cans.
Question 3.—How much does each of the cans named hold, or what is the capacity stated on the label?

Twenty-five were unable to make any answer. Five stated that they were familiar with the trade names of the cans, but out of those five only two were able to name three sizes and state what they held. If people who are trained in weights and measures work and who are constantly checking on packages that are sold in grocery stores do not know the trade designations, it certainly is apparent that it cannot be expected that the housewife is going to know them. The argument

Digitized by Google

in favor of our present system is sometimes to the effect that the cans are labeled with their contents. This is true, but I will later show that this labeling does not mean very much to the purchaser; further, the purchaser cannot very well read the label until after the purchase is taken home, and then it is too late to do anything about it.

There is a nice bit of history that is connected with most of the cans in this exhibit, but to relate that history would occupy too much time, and for that reason I am merely selecting a few.

There are industries located in many States represented by certain cans in this exhibit, and these particular products could well be the subject of particular study by the sealers having jurisdiction in that particular State. To better illustrate what I mean, I will take a product of my own State first.

Wisconsin a great dairy State.—Wisconsin is known and recognized throughout the Nation as a great dairy State, the foundation of which is 180,000 dairy farms. Wisconsin produces approximately 38 percent of the evaporated milk of the United States, or about 700 million pounds. About 75 percent of the common evaporated milk that we are all familiar with goes into the favorite can now used for that commodity, the one that I have numbered 31 in the exhibit, this particular can holding 13¾ fluid ounces (14½ ounces avoirdupois).

I wonder if anyone noticed any decided change in the price of canned milk in the year 1931. I do not think that they did, but what happened to this favorite can about that time? Previous to 1931 the favorite can for milk was the one that I have numbered 22 in the exhibit. This can holds 16 fluid ounces; however, it was labeled 1 pound avoirdupois, but in reality held a little more than this amount. Perhaps a person looking at this can by itself would not recognize any particular difference in size between it and the present can used for milk, which is no. 31 in the exhibit, but place them side by side and there is a large apparent difference; as a matter of fact, there is more than 1½ ounces difference. In other words, in 1931 the people canning milk reduced the size of the favorite can 1½ ounces. Now let us see what this difference of 1½ ounces amounted to. Canned milk is selling for about 8 cents per pound, and as I mentioned a few moments ago, there is at least 75 percent of the evaporated milk in Wisconsin put into the new sized cans. This 1½ ounces figured at 8 cents per pound equals more than 3½ million dollars annually for the State of Wisconsin alone; for the Nation it would be about 10 million dollars.

Now I wish to call your attention to another amazing fact; under our present laws, both Federal and State, cans of the different products may be labeled with their contents in many ways; they may be labeled in terms of avoirdupois weight, or they may be labeled in terms of liquid measure; they could also be labeled in the metric system, if any one desired to do so. Usually, however, it is avoirdupois weight, and for a reason that I will mention shortly. Usually, when the label states, for illustration, "net weight 14½ ounces", it means avoirdupois weight, while if it says "14½ ounces fluid" it means liquid measure. Very few people realize this, however, and it is important to bear this fact in mind for the illustration that I am going to give.

Water, as you all know, at testing temperature weighs 8.323 pounds per fluid gallon, therefore, the old table that we have learned by rote,

Digitized by Google

which is something to the effect that the pint is a pound, is not correct; therefore, a product labeled in terms of avoirdupois weight appears greater than if it was labeled in terms of fluid measure; that is the reason that most of our products that I have mentioned are labeled in terms of avoirdupois weight rather than in fluid ounces. This can of milk that I have just mentioned is properly labeled "net weight 14½ ounces", but it actually holds only 13¾ ounces fluid measure.

Now for the other amazing fact. Let us take the can that I have numbered 38 in the exhibit; this can is labeled "net weight 14 ounces", and is a can of sweetened, condensed milk. The favorite can of evaporated milk that I have just mentioned is labeled "14½ ounces." The customer sees these two labels and learns that there is only ½ ounce difference in the size of the cans. When you place them side by side, you will readily see that there is much more than that amount of difference in fluid measure; in fact, one can labeled 14½ ounces holds 13¾ fluid ounces; the other that is labeled 14 ounces, actually holds 10¾ ounces in fluid measure; there is 3 ounces difference while the label indicates to the purchaser that there is ½ ounce difference, and the strange part of this whole business is the fact that both of these apparent inconsistencies are correct. The difference is in the different specific gravities of the commodities, but what difference does the specific gravity make to the housewife as far as the purchase of the commodity is concerned; that is a matter that can be, and is taken care of, by State and Federal regulation in providing the standard of quality for most of the products.

Canned peas.—Another very mystifying effect in juggling and camouflaging cans is illustrated by two sizes of canned peas; one of the cans is numbered 15 in the exhibit, and the other is numbered 20. This can numbered 15 is what is recognized in the Canners' catalog as a no. 2; it actually holds 19¾ ounces liquid measure, and it is labeled "net weight 1 pound 4 ounces"; this is the common 20-ounce can. I believe that more people are familiar with this can than most of the other cans in the exhibit. Now let us see what has happened in the sale of this very popular commodity recently. The can that I have numbered 20 is what is known in the Canners' catalog as no. 303 and actually holds 16⅜ fluid ounces, and the can itself is labeled "1 pound 1 ounce", which is in reality 17 ounces avoirdupois. Recently the company putting up this particular brand of peas changed from the labeled 20 ounce can to the labeled 17-ounce can, which is a change in the Canners' phraseology from a no. 2 to a no. 303 can. Here, again, it is difficult for the purchaser to see very much difference in the cans unless they are placed side by side, but you will observe that one can will slip nicely inside of the other one. There is a difference of 3 ounces in the size of these cans, and to prove that there was no apparent difference made in the price to the consumer when this change took place last year, I have only to cite several cases where the dealers selling this brand of peas did not even know themselves that they were getting a 17-ounce can instead of the customary 20-ounce can; in fact, we have cases on record in States where there is a law requiring that the weight of the contents of the packages as stated on the label must be put in the advertisement, where dealers had actually advertised a 20-ounce can and had delivered in answer to the advertisement the 17-ounce cans. As a matter of fact, the company packing this particular brand of peas discontinued using the so-called

Digitized by Google

no. 2 can entirely and put their entire pack into the so-called no. 303. I do not have just at the present time the sales volume for the pea canning industry, but I dare say that a reduction of 3 ounces in the size of the cans would make a large sum of money. In this particular instance, in the sale of these cans that I have before me, the advertisement stated "two 20-ounce cans for 19 cents"; when the purchase was made, it was found that they were 17-ounce cans; at even ½ cent an ounce it means that the consumer was cheated out of 1½ cents on this particular can.

Syrup.—Another illustration of what is happening in canned commodities may be illustrated by referring briefly to syrup. I think most of us are familiar with certain brands of syrup, and perhaps you will recall that the can that I have numbered 19 in my exhibit contained a favorite brand of syrup. This can is labeled "1½ pounds net weight", and actually holds 17 fluid ounces. Not very long ago this particular kind of syrup was packed in a can that held 2 pounds net weight. Here again I will leave it to your judgment as to whether or not you noticed any decided drop in price when the quantity was reduced, and to show what may happen, in fact, what is happening, it is only necessary to refer to another particular kind of syrup or molasses; can no. 24 in the exhibit is a favorite brand of so-called molasses. This particular can is labeled "net weight 1 pound 3 ounces", "net contents 13 fluid ounces", and it actually holds 15⅞ fluid ounces. This sort of labeling is about as enlightening as the report of a certain wedding where it was announced that invitations were sent to 100 people, and they expected 80 and laid covers for 50, but it illustrates in a concrete way what may happen when one company standardizes on the basis of 1½ pounds and another company immediately gets out a size that is 5 ounces smaller, then purports to sell for the same price. I do not have figures to show what has happened when the quantity of this commodity was reduced one-fifth, but no doubt there would be many thousands of dollars lost to the consumers in this case.

Honey pails.—Now I am coming to the can that heads the exhibit as far as capacity is concerned. The can that is numbered 1 in the exhibit is the pail for honey that is supposed to hold 10 pounds. In this particular case the packer got his label mixed up and the 5-pound label is on this particular pail. This pail of honey is 7 ounces short of a gallon, and I dare say that at least 95 percent of the people today believe when they are buying a 10-pound pail of honey that they are getting a gallon, but they are not. Can no. 4 in my exhibit is the 5-pound pail of honey, and this is 3½ ounces short of ½ gallon. So far as I have been able to establish, these pails for honey come the closest to being of standard size of any of the customary cans.

No. 10 can.—Another false impression that I am sure is abroad in the land is the fact that most people think that a 10-pound pail of syrup or a 10-pound pail of honey is the same sized pail as the so-called no. 10, but such is far from the fact. A can that is recognized as a no. 10 in the Canners' catalog I have numbered 2 in my exhibit and this particular can holds 5½ fluid ounces more than 3 quarts, and this particular can is frequently sold as a gallon. A short time ago a dealer was fined $25 and costs for doing this very thing. He advertised 1-gallon cans of crushed pineapple, and when our investigator purchased a can in answer to this advertisement, he received a can

Digitized by Google

similar to this one which contained 26½ ounces short of a gallon. This particular can is labeled "Contents 6 pounds 10 ounces."

We have also found these particular sized cans filled with cherry juice and offered for sale as gallon cans. I think if you will carefully examine advertisements in your respective States, that you will find all kinds of fruits advertised as fruits in gallon tins, and that investigation will disclose the fact that they are not gallon tins, but tins quite close to the capacity of this can which is the regular no. 10, and probably some of them will hold only 3 quarts instead of the advertised 4 quarts.

Canned ear corn.—To further illustrate the fact that conditions in the canned-food industry are getting worse, we have only to examine the newer canned commodities. Can no. 3 in my exhibit is one that is used in the canning of corn on the cob. This can does not conform to any recognized measurements of any kind, either the Canners' catalog or any standard measurement. Neither does it conform to any of the other cans in the exhibit, and to show what the packer was up against, one has only to read the label. The label had stated "approximately 1 dozen whole ears", then apparently it was discovered that the tops of the ears had to be removed, and for fear of getting into trouble for misbranding, the word "ears" has been obliterated. Then to get the quantity right, the can is labeled "8 to 10", referring to the ears, and the picture on the can indicates six ears; as a matter of fact, there were eight ears in this can, and there were eight ears in nearly all cans of similar size, and the can is labeled "Contents approximately 3 pounds 4 ounces."

Now, let us examine another can for cob corn. No. 9 in the exhibit is labeled "4 whole ears of fresh corn on the cob", and the picture clearly shows four ears and in this instance there were four ears in the can. This can is labeled "net weight 13 ounces" and it actually holds 33 ounces fluid measure, only 1 ounce over a standard quart. This particular can retailed for a trifle less than 20 cents, while can no. 3 retailed for about 60 cents, or three times as much as can no. 9, but the can selling for 60 cents was about 20 ounces short of three times the capacity of the no. 9.

I am giving this illustration to show that it is impossible to buy intelligently when there is no fixed standard of quantity, and where the labeled quantity is camouflaged in such a way that it means nothing.

Tomato juice.—Among other new commodities, we have a conglomeration of cans for tomato juice. We have four cans that are quite close to each other in capacity; they are numbered 5, 6, 7, and 8 in my exhibit. Two of these cans are labeled 50 fluid ounces, one of them is labeled 48 fluid ounces, while one of them is labeled 46 fluid ounces, but none of them are labeled correctly; all are misbranded. In this particular instance, however, they are all labeled under capacity.

Then we have another little group in the exhibit numbered 11, 12, 13, and 14. These cans are quite close to 21 ounces in fluid capacity; however, there is a variation of 4 to 5 ounces between the cans in this little group. Apparently, in this particular commodity, competition has run wild and the original standard is being forgotten and the cans are gradually being made smaller than the original standard.

Digitized by Google

Below this particular group of cans for tomato juice are various smaller ones, no. 29 in the exhibit being a can that is labeled 14 fluid ounces and holds 14⅝ fluid ounces. This happens to be a can that is the so-called no. 300 in the Canners' catalog. Nos. 34 and 35 are cans that are a little bit smaller in capacity than the no. 29.

Deceptive cans.—Now we come to still another and a different method of deception. Cans may have certain prescribed measurements and yet may not hold the correct capacity. An illustration in a small way of this are the two cans in my exhibit numbered 40 and 41. Can no. 40 is the orthodox picnic no. 1 in the Canners' catalog, and the outside measurements conform to their specifications. Can no. 41 also has the same measurements; however, the shape of the bottoms of these cans and also the tops make nearly a quarter of an ounce difference in the capacities.

Deception of long standing.—In about 1911 and 1912 Dr. Fritz Reichmann, Superintendent of Weights and Measures of New York, sponsored considerable publicity in regard to the deception of packaged foods. It was my good fortune to be able to get considerable material that Dr. Reichmann used, and I have slides that were prepared under the direction of Dr. Reichmann which, I think, bear on this subject, and I will just read some of the items that he mentioned as being deceptive and indicating what he termed actual shortage in the commodity sold.

Cans for vegetables, formerly sold as gallons, now called no. 10; the actual size being about 3 quarts, shortage 1 quart.

What was formerly sold as 3 pounds, now called no. 3, actual size 1¾ pounds; shortage, 1¼ pounds.

What was formerly sold as 2 pounds, now called no. 2, actual size 1 pound; shortage 1 pound.

He also has listed in canned meats what was formerly sold as 2 pounds, now called no. 2, actual size 1⅜ pounds; shortage ⅝ pound.

He also listed quite a number of other items that I will not take the time to mention now, but this will serve to show that the conditions existing in 1912 exist today, and the odd-sized cans have multiplied in number many times.

Annual saving.—According to the latest estimate that I have seen, there are 6 billion cans of fruits and vegetables packed in the United States yearly. If we estimate that there could be just 2 ounces per can saved by standardization, at ½ cent an ounce, this would make 60 million dollars for the Nation, and I believe that with the various estimates of shortages that I have given, this figure is very conservative; in fact, I think it could be multiplied by two and still be conservative. This saving would be the saving on the commodity. The other saving would be accomplished by reducing manufacturing and distribution costs of this vast number of odd-sized cans. It seems to me that this saving would be several times the saving on the commodity. Again, the saving to the retail dealer would be tremendous. These 52 cans occupy a space of more than 17 feet, and we see no reason why the number of sizes might not be reduced so that the space occupied by the standardized cans would not be more than 3 feet at the most. Think of what this would mean to the retail dealer in his display space.

Impossible to check the vast number of cans.—There is another point that I wish to make, and that is the fact that if the people of this

Digitized by Google

country realized that they were not getting accurate measurement in the cans of food that they are buying now, they would demand that these cans be carefully checked, and I know that every one will agree that it is impossible under present conditions for the sealers of weights and measures to give the consumers or the honest packers any protection now. You can readily see that if you were to undertake to commence making try-outs on this vast number of cans, it would be a task far beyond any bureau of weights and measures in the country; by the time you had checked half of the cans there would be a new lot on the market, and you would need to start all over again.

Standardization not new.—Standardization of packages or containers is not new. In fact, we have any number of precedents to guide us, but it just seems as though the most important part of standardization has been forgotten.

Nearly every State in the Union has milk bottles standardized, and certainly no one would advocate returning to the old system in the bottling of milk. A great many States have laws standardizing loaves of bread, and in those States where the standards have been in effect for some time there is no call for going back to the old system. These two products are distributed over a relatively small area, and therefore the State laws have been sufficient, but in the case of canned foods the distribution is over a wide area, and therefore a State law alone would not be sufficient. Now we have precedents to go by under our Federal law.

Most of you remember the time when berry boxes were not standardized; most of you remember the time when the bottom of the berry boxes was gradually shoved towards the top until there was more space on the bottom than there was space for berries on top. The Federal law of 1916 immediately changed all this. Berry boxes were standardized on the basis of 1 quart, 1 pint, and ½ pint dry measure, and immediately most of our trouble relating to odd-sized boxes was eliminated. We also have Federal laws standardizing barrels, baskets, and hampers, and in all of this standardization work the standards have been on the basis of our customary dry measure. It is therefore reasonable to apply this same principle to the standardization of canned foods.

I have seven standardized cans in my exhibit, the 1 gallon, ½ gallon, 1 quart, 1½ pint, 1 pint, ½ pint, and ¼ pint.

Bill H. R. 6964.—There is before Congress at the present time bill H. R. 6964, which provides that all fruits and vegetables and canned milk be put in standardized cans which are of capacities based on our customary fluid measure standards. The standardized cans in my exhibit are somewhat similar but are not made to the exact measurements required in the bill.

Standard measure.—In closing, I wish to remind this Conference that in all its deliberations extending over a period of more than 30 years, it has always been its aim to respect and perpetuate the standard weights and standard measures that are so carefully and jealously guarded and protected by this National Bureau of Standards. These standards are the ones that were established at the recommendation of men like George Washington, Thomas Jefferson, and John Adams, and I believe are the standards that we should stick by and apply to our canned foods rather than be led astray and start off with some new designations such as 1, 2, or 3, or picnic, or special, or 303, or anything of that sort.

Digitized by Google

DISCUSSION OF ABOVE PAPER

The ACTING CHAIRMAN. Mr. Warner, we thank you very much for your instructive talk.

MR. BOYLE. I just want to mention an experience I had along this line. Shortly after the end of the NRA, prices were raised, and we found in investigating and reweighing packages that one brand of milk formerly packed in cans, weighing 16 ounces, had been reduced to 14 ounces. I would not say that the milk can was the original 16-ounce size. In the case of packaged cereal, however, an original statement of weight of "55 ounces" on the package was blanked out and "48 ounces" substituted.

We also have found that a large manufacturer of soap powder has changed the weight of the powder in his package three times in 6 months without notice to or knowledge of the purchaser. We found it necessary to prosecute one of the national chains for advertising that powder at a weight greater than the actual weight labeled on the packages. They were working on the supposition that the weight they advertised was the true weight but this was not the case. In Maine we have a law which says that if you offer for sale or expose for sale a quantity less than you represent, you may be cited. This requirement is not limited to food, so when we investigated it was found necessary to cite them to court under this section and we got a conviction. I was very much interested in Mr. Warner's paper.

Mr. CULLEN. I would like to ask Mr. Warner if he has any more copies of the paper.

Mr. WARNER. If anyone wants a copy of the paper and will leave his name with the Chairman, I will see that he gets one later.

The ACTING CHAIRMAN. Mr. Warner placed mimeographed copies of his talk on the table. There weren't sufficient to go around. They were all sold out before he concluded his address:

Mr. WHITE. Mr. Warner, I note that in all of your references to the bill you use the term "fruits, vegetables, and milk." Isn't any attempt going to be made in this bill to standardize all canned products?

Mr. WARNER. The first idea was to standardize all commodities put up in metal containers, but the different interested parties seemed to think that this might jeopardize the bill, so that is the reason it was reduced to canned vegetables and canned milk. They figured that if there was a law of this kind in effect it would prove so beneficial and be so well liked by all interested parties that it would be adopted by them immediately.

Mr. WHITE. You made reference earlier in your talk to the attempt of the National Canners' Association to standardize cans. I know that has been in a great measure in reference to containers for canned salmon. There are several million cases of canned salmon put up in Alaska, Washington, and Oregon yearly, and I think, inasmuch as there has been a rather important attempt to standardize that commodity, it should be included. I don't think there would be any opposition from that group. I think canned oils are in the same category.

Mr. LEAVITT. Mr. Chairman, the question of packaged commodities is causing all of the State sealers quite a little trouble, especially due to the fact of the acute competition in various lines of merchandising. I don't see why we necessarily have to confine it to canned

Digitized by Google

goods. I would like to place a motion before the house that we appoint a committee, or instruct some standing committee to work out a plan for standardizing packaged commodities of all kinds.

In our State we have a bread law which says that the net weight must be stamped on each loaf of bread. I found in the stores that there were 13 different weight statements on loaves of bread, and the housewife, when she orders a loaf of bread, doesn't know what she is going to get. Some of the stores advertise a loaf of bread at 8 cents, others at 7 cents, and it is very confusing. The same thing applies to canned goods. They advertise canned vegetables, canned corn, or canned tomato juice. A lot of housewives order their supplies by telephone and after they are delivered, as you say, it is too late to do anything. I don't know of anything this Conference can do to advance weights and measures work further than to take some step toward standardizing all packaged commodities.

If we get a standard-package commodity law that can be adopted by the various States, and if the Bureau will recommend a definite standard law on that, and let each State pass it for itself, it will save a lot of confusion. These manufacturers putting up commodities can't put up a different size for every State, and our Bureau here should take the lead in those things so we will have a definite standard for all package goods.

Mr. SWEENEY. I think, in order to expedite matters, it would be a good thing to refer this to the Committee on Resolutions.

Mr. GRIFFITH. Mr. Chairman, I am quite sure we are all in accord with the exhibit and the wonderful talk that Mr. Warner gave us, and in view of the fact that the Honorable Mr. Sauthoff has a bill in Congress, may I suggest that those present, State and city and county or community sealers, write to the Honorable Mr. Sauthoff, giving him their experiences so that he may use that information in pressing his bill for passage. It will not involve the Conference but I am sure he will be glad to have any information that will be in support of standardization of cans.

Mr. WANDLING. Is there any objection to the body going on record in favor of the bill?

The ACTING CHAIRMAN. I think a suggestion has been offered. We have a Committee on Resolutions, and something may come from the Committee.

(At this point, at 11:15 a. m., the Conference took a recess until 12:15 p. m.).

Digitized by Google

National Bureau of Standards Vehicle-Scale Testing Unit.

Views made during test of motortruck scale at the United States Naval Academy, Annapolis, Md.

NBS Miscellaneous Publication M159



FIGURE 1.—*Unit spotted at scale ready to begin test.*



FIGURE 2.—*1,000-lb weights being unloaded during test of right end of scale.*

Digitized by Google

Digitized by Google

FOURTH SESSION—AFTERNOON OF WEDNESDAY, JUNE 2, 1937

DEMONSTRATION TEST OF MOTORTRUCK SCALE WITH NATIONAL BUREAU OF STANDARDS VEHICLE-SCALE TESTING UNIT

(Immediately after luncheon the delegates and guests proceeded by chartered busses to the United States Naval Academy in Annapolis, Md. A complete test of the 40,000-pound motortruck scale of the Academy was made by the National Bureau of Standards vehicle-scale testing unit. After this test ample time was afforded to inspect the grounds and buildings of the Naval Academy and to witness the drill at dress parade of the regiment and the award of prizes, one of the features of the ceremonies of "June Week", before the return of the busses to Washington.)

Digitized by Google

FIFTH SESSION—MORNING OF THURSDAY, JUNE 3, 1937

(The Conference reassembled at 10 a. m., at the National Bureau of Standards, Dr. Lyman J. Briggs, President of the Conference, in the chair.)

APPOINTMENT OF COMMITTEES

The CHAIRMAN. The chair announces the appointment of the following committees:

Committee on Resolutions:

C. J. P. Cullen, Pennsylvania, chairman.
C. D. Baucom, North Carolina.
John J. Levitt, Illinois.
Charles C. Read, New Jersey.
L. J. Allen, Seattle, Washington.
William H. Ising, Jr., Louisville, Ky.
Arthur J. Wilhelm, Hamtramck, Mich.

Committee on Nominations:

J. P. McBride, Massachusetts, chairman.
O. E. Brenneman, Ohio.
H. N. Davis, Vermont.
C. E. Tucker, California.
C. H. Bulson, Jefferson County, N. Y.
B. W. Ragland, Richmond, Va.
C. B. Tolan, Ft. Wayne, Ind.

DEMONSTRATION OF RECENT DEVELOPMENTS IN WEIGHING AND MEASURING APPARATUS, BY REPRESENTATIVES OF MANUFACTURERS

SECRETARY'S NOTE.—At this point several manufacturers brought before the Conference samples of apparatus embodying new design features, and demonstrated them to those in attendance. Particular attention was given to the new features incorporated, the method of manipulation of the adjustments provided, and the answering of questions asked by members. As was the experience in former cases, it was found that many of the remarks made are of no value to a reader when a sample of the product is not before him, and thus no good purpose would be subserved in printing such material here. Consequently it has been omitted from the report.

It may be noted that such demonstrations as these, which familiarize the delegates with new apparatus, are of great interest and value to them. Attendance at the Conference is the only way in which advantage can be obtained from program features such as this. The delegates were duly appreciative of the efforts of the manufacturers who took part in this demonstration.

RESULTS OF TESTS OF VEHICLE SCALES MADE WITH NATIONAL BUREAU OF STANDARDS EQUIPMENT IN PROGRAM OF COOPERATION WITH STATES

By RALPH W. SMITH, *National Bureau of Standards*

At the Twenty-sixth National Conference on Weights and Measures, held a year ago, announcement was made of the program of vehicle-scale testing which the National Bureau of Standards proposed to inaugurate in cooperation with the States. The purpose of this program was, basically, to assist the States in the procurement of

Digitized by Google

adequate testing equipment for the proper examination of wagon and motortruck scales in commercial use.

Yesterday you saw a test of a 40,000-pound motortruck scale made by the Bureau's vehicle-scale testing unit. It is the purpose of my talk today to give you some of the results of the testing work carried on by this unit during the past 6 months.

I may say in introduction that the unit in question was delivered to the Bureau in October 1936. Following some preliminary experimental operation of the unit to familiarize the personnel with this equipment, our first official test was made on November 5. For a period of some weeks thereafter we tested the various vehicle scales owned by the Federal Government in the vicinity of Washington, D. C., and did a small amount of work in the city of Baltimore in cooperation with S. T. Griffith, Chief of the Division of Weights and Measures of that city. On November 24, 1936, we began the first State schedule in Virginia. In the intervening months we have completed five State schedules: In Virginia, in cooperation with J. H. Meek, Director of the State Division of Markets; in North Carolina, in cooperation with C. D. Baucom, State Superintendent of Weights and Measures; in South Carolina, in cooperation with J. Roy Jones, Commissioner of Agriculture, Commerce, and Industries; in Georgia, in cooperation with S. H. Wilson, State Oil Chemist, and in Florida, in cooperation with Nathan Mayo, Commissioner of Agriculture. In each of these cases the original plan of procedure has been followed; that is, the State officer has arranged an itinerary for our equipment to include such territory as he wished to cover with the particular thought in mind of securing data on a representative number of typical vehicle scales throughout the State. Our testing unit has always been accompanied by the State officer or someone from his department or by a representative of the local jurisdiction in which the work was being done or, and this was frequently the case, by representatives of both jurisdictions. Reports have been issued on the individual scales examined, the originals going to the scale owners and copies going to the cooperating State and local officials. At the conclusion of the work in each State a summary report has been prepared and placed in the hands of the State officer giving him in a single document the essential facts in relation to the vehicle scales examined in this State.

In order that you may have a record in some detail of our test routine, of the character of reports issued, and of certain data relative to our vehicle-scale testing unit, we have prepared and assembled in convenient form facsimile copies of the field records of the test of a 40,000-pound motortruck scale and facsimile copies of four typical reports of vehicle-scale tests. Supplementing this material is a sheet giving dimensional and other data relative to our vehicle-scale testing unit, and an illustration of the unit made in the course of a regular test. Copies of this material have been placed on the Secretary's table and you are welcome to help yourself to these; it is believed that each weights and measures official will find it interesting and advantageous to read over all of the material I have referred to.[4]

In this connection I wish to say that the field records and reports in question have been reproduced just as they are in our files with the exception that we have deleted entries in the headings which might

[4] See appendix beginning on p. 117 of this report.

Digitized by Google

disclose information which we felt we were not at liberty to publish. Such information includes the identification of the particular scales, scale owners, and jurisdictions involved. In reproducing the field records a portion of a blank form was stapled in place over each original record.

I would call your attention particularly to the supplement appearing on the reverse of the first page of each of the test reports. This supplement outlines the test method and the requirements upon which scales are classified as accurate or inaccurate in our reports.

During the course of our operations we have found it advisable to make some changes in our test routine as compared with the methods followed during the first few weeks. These changes have been dictated by considerations of simplifying the test routine where this was practical, of establishing a procedure under which each element of the scale will be adequately checked and, in general, of making our test as effective as possible. The emphasis has been placed upon completeness of our test rather than upon speed. We realize that speed is desirable but it is felt that the most important consideration is to develop fully the performance characteristics of the scales which we examine.

In the five States which I have named, we have operated for approximately 23 full test weeks and have examined in that time 344 vehicle scales. This gives us an average of approximately 15 scales per week of testing operation. In considering this figure it should be remembered that our equipment is not, in most cases, testing all of the scales in any given town or city, and that there is a considerable loss of time in making the necessarily frequent movements from place to place.

The total mileage covered by our testing truck is approximately 6,000. The truck is now nicely broken in and is giving excellent service; there have been no truck failures, and we have never yet found ourselves in a situation in which there was any doubt as to the ability of the truck to meet every demand as to power and traction.

In presenting some of the detailed results of our tests in the five States so far covered, I wish to point out that these States all lie in one particular section of the country. Moreover, it is only fair to note that in two of the States there are no State agencies charged with the duty of inspecting scales, and only a small number of local jurisdictions have local inspection, and that the other three States, although having State organizations for the testing of weighing and measuring devices, are hampered by inadequate facilities for the testing of vehicle scales. On the other hand, conditions worse than we have found are reported by at least one State in another section of the country, where tests have been carried on for years but where tests of vehicle scales are being made for the first time with adequate equipment for this purpose.

In the data which follow, percentages are not invariably based upon the total number of scales examined; in some cases particular kinds of information have been recorded only during the past few months.

Proceeding, then, to the statistical portion of my remarks, I may say that 67 percent of the scales examined were used for the weighing of coal, either exclusively or in combination with other commodities. Based upon our best judgment in the matter, 61 percent of the vehicle

Digitized by Google

scales examined have been of the wagon type, only 39 percent being of the type which could be classed as "motortruck." Scale capacities have ranged from a minimum of 6,000 pounds to a maximum of 60,000 pounds; 47 percent of the scales had nominal capacities of 20,000 pounds, and the 30,000- and 40,000-pound scales comprise about 12 percent each. Platform sizes have ranged from a minimum of 12 feet by 8 feet to a maximum of 40 feet by 10 feet. Minimum and maximum widths of platforms were 7 feet and 13 feet, respectively. The most common platform lengths were 14 feet (15 percent); 16 feet (14 percent); 18 feet (16 percent); 20 feet (18 percent); and 22 feet (19 percent).

Nineteen percent of the scales utilized counterpoise weights. In connection with these scales, 347 counterpoise weights were separately tested by comparing them with standards of the Bureau; 35 percent were found accurate; 47 percent were found light; and 18 percent were found heavy.

Eleven percent of the scales examined were of the automatic-indicating type.

As found, 37 percent of the scales were out of balance at zero by more than 5 pounds. In the case of 66 percent of the scales examined, the approaches at one or both ends of the scale were inclined to the scale platform, the gradients ranging from what is reported as "slight" up to 15 percent; in many cases the approaches are reported as curved, the curves being so sharp in some cases as to contribute to excessive wear and derangement of scale parts as vehicles were driven on and off the scales. Overhead obstructions, either roofs over scale platforms or gateways giving access to scales, were encountered in 46 percent of the scales examined, the minimum overhead clearance encountered being 7 feet 6 inches.

Many lever systems were of the conventional "A-lever" type, and the lever systems of the motortruck scales were largely of the "Railroad pattern." However, a number of odd arrangements of levers were encountered and in one instance a scale having wooden levers was tested. Accessibility of the lever system is reported as "very good" in only 1 percent of the cases, as "good" in 42 percent, as "fair" in 39 percent, and as "poor" in 14 percent. It is reported that provision has been made for pit drainage in only 45 percent of the installations examined; in arriving at this percentage, we have considered provision to have been made for pit drainage even when this consisted only of a hand pump for pumping out the pit.

Many varieties of lever foundations have been encountered; these ranged from adequate concrete foundations down through various types of brick, masonry, and timber combinations, to timber alone.

In reporting scales as accurate or inaccurate we have adhered, of course, to the Conference tolerance requirements. A few scales are necessarily reported as inaccurate upon a single error in excess of the tolerance. In most cases, however, inaccurate scales will have errors in excess of the prescribed tolerances at several or at all test loads. In order to arrive at an average figure representing the percentage inaccuracy of all scales tested, we record as the percentage error of the scale the maximum percentage error developed by any one of the primary elements of the scale, exclusive of errors which would result from the use of inaccurate counterpoise weights. Six scales have been

Digitized by Google

found to have abnormally large percentage errors; these ranged from 14.67 to 40 percent. One scale in daily use by the owner was not tested because of derangement of the lever system; the shackle connection between two of the main levers had been broken and the short lever had dropped down into contact with the truss rod of the long lever. This particular scale has been classified as an inaccurate scale, although it is necessarily omitted in computing mean percentage errors.

SCALES WITH ABNORMALLY LARGE ERRORS

Error (%)	Cause
31.65	The scale appeared to have been designed to have a multiple of 750:1; it actually had a multiple ranging from 752:1 to 770:1. Moreover, it was being used with counterpoise weights designed for use on a scale with a ratio of 1000:1. The error is based upon these conditions of use.
14.67	There was a serious binding condition which could not be identified because it was impossible to make an inspection of the lever system; the platform was bolted down so securely from the under side that access from that point could only be had by removing the entire weighbridge, and there was no hole big enough for the inspector to crawl through. A small boy was prevailed upon to worm his way into the pit, and he dug some of the dirt away from the levers; this treatment, however, made almost no difference in the magnitude of the weighing error.
17.00	This scale had four main load bearings at each end—eight in all. Six of the original eight load-bearing steels were missing.
24.00	A serious bind developed under load between the weighbridge girder and a portion of the foundation.
40.00	A serious bind developed between a weighbridge girder and a fulcrum stand tie rod.
14.67	This was a pitless type scale, installed in a pit having a concrete floor. Clearance between the scale levers and the floor was very small, and under load one of the main levers settled or deflected sufficiently to rest on the floor.

Considering, then, the total of 343 scales actually tested by our equipment in the five States under consideration, we find that the numerical mean of the maximum percentage errors is 1.39 percent, approximately seven times the weighbeam tolerance of 0.20 percent. These scales include 19 municipally owned scales; 3 State-owned scales; 1 county-owned scale; and 6 federally owned scales, the balance being scales in ordinary commercial service. If we exclude from consideration the six scales having the abnormally large errors, as noted above, we find the numerical mean error reduced from 1.39 to 0.99 percent.

The percentage of scales inaccurate for all of the scales under consideration is 83 percent.

Twenty-seven percent of the scales tested are found to have shifted their zero balance by more than 5 pounds at the conclusion of a test. Upon 22 percent of the scales, the indications of weighbeam poises are found not to be in agreement or, in the case of scales utilizing counterpoise weights, one or more of the weighbeam bars is inaccurate when considered independently of the ratio error of the scale.

It was considered practicable to make nose-iron adjustments in only nine cases. It is our policy to undertake such adjustments only in cases where the mechanical condition of the scale is good and it is considered that the errors found are to be ascribed almost entirely to an incorrect lever ratio; we do not make nose-iron adjustments where these would mask errors primarily caused by faulty installation or maintenance. In eight of the nine instances where we made nose-iron adjustments we were successful in bringing within tolerance a

Digitized by Google

previously inaccurate scale; in the remaining scale, the travel of the nose iron was insufficient to permit of correction of the scale error. "Corrections" were made in the case of 17 percent of the scales tested. These "corrections" were of various kinds, ranging from the clearing away of accumulations which were causing binding conditions, to the repositioning of parts which had been incorrectly mounted; in many cases the corrections were made before the test was started. In a number of cases the corrections resulted in the reduction of errors and in 10 instances these corrections brought within tolerance scales previously found inaccurate. Efforts were made in 46 instances to reduce sensibility reciprocals to a value within the prescribed limit. In many cases the condition of the scale was such that raising the weigh-beam balance ball assembly to its maximum height had but little effect upon the SR. However, such adjustments were successful in 11 instances in reducing the SR to a value within the prescribed limit.

Considering all of the scales to which the SR requirements were applicable, it is found that only 39 percent of these met the requirements; if we limit our consideration to accurate scales, that is, those conforming to the tolerances, we find that 66 percent of this group met the SR requirements. Three scales were found to be in unstable equilibrium.

An essential part of the Bureau's test of a vehicle scale is the inspection of the scale pit and of the scale parts in the pit as well as all of the other elements of the installation. In a few instances it has been found impracticable to make the pit inspection because access could not be had to the pit. Scales have been found in which the platform planks were so securely positioned that none of them could be raised without material damage; where no other means of access to the pit is provided, such conditions preclude inspection. In numerous cases pit inspections have been prevented because of water in the scale pit; occasionally water in the pit has not been so deep as to prevent all inspection but has made a complete inspection out of the question.

The following summary of conditions found as a result of inspection as distinct from test is presented as an indication of the faults to which many weighing errors and a large part of the deterioration of scale installations may be ascribed, and particularly as indicating a fertile field for educational activity on the part of the weights and measures official so that scale owners may be given proper instruction relative to installation and maintenance conditions.

Fault	*Percent*
Water standing in scale pits, or stopped drains	22
Dirty pits, conditions ranged from a slight accumulation of foreign matter to accumulations so deep as practically to bury the lever systems	43
Rusting structural steel in the pit	27
Rusting or dirty pivots and bearings of the platform lever systems (pivots and bearings had been protected against corrosion in only 42 percent of the scales examined; this protection was given by grease in 29 percent, by oil in 5 percent, and by paint in 8 percent)	58
Worn or broken pivots and bearings	25
Pivots and bearings displaced from proper relative positions	21
Levers out of level	10
Loose levers or T bearings	6
Out of plumb bearings and connections, including out of plumb beam rods	32
Inadequate clearances around elements of the platform lever systems or actual interferences with such parts	21
Check rods missing, disengaged, broken, or improperly adjusted for freedom	14

Digitized by Google

Fault	Percent
Improper clearances around scale platform (in the large majority of these cases the clearances were found to be inadequate, although in a few instances clearances were excessive)	39
Scale platforms and copings not in surface alinement	4
Scale platforms in need of repair or renewal	28
Inadequate clearances around beam rods	8
Dirty, rusted, or tarnished weighbeam assemblies (in numerous cases the weighbeams were in such condition as to make it difficult to read their indications)	35
Mechanical faults in weighbeam assemblies, such as battered poise stops, improperly mounted elements, broken poise parts, etc	18
Insecurely mounted weighbeam supports, such as shelves, pillars, fulcrum hooks, etc	13
Interferences in reading-face mechanisms	4

In conclusion, I wish to discuss briefly the overloading of scales. Not so many years ago all vehicle loads were wagon loads in which the loads were distributed approximately equally between the two axles of the vehicle. The scales of those days, known as wagon scales, were designed for the weighing of these wagon loads and when a scale had a capacity of, say, 12,000 pounds, it was designed on the assumption that the end loading would not exceed one-half of the nominal capacity of the scale, or 6,000 pounds. With the advent of the motortruck, weighing conditions changed; instead of the truck load being equally divided between the two vehicle axles the loading over the rear axle was much in excess of that over the front axle. Today we find that as much as 90 percent of the gross weight of a loaded motortruck may be carried by the rear axle of the vehicle.

It is generally accepted, I believe, that a wagon scale is suitable for the weighing of motortruck loads only up to 60 percent of its wagon capacity.

In the case of old wagon scales, these are not marked in any way to show their limitations when used for the weighing of motortruck loads. More recently, however, wagon scales have been marked to show both their "wagon" capacity and their "motortruck" capacity. So far as I know these marked motortruck capacities are always 60 percent of the marked wagon capacities.

It seems that it should be obvious that if a scale is overloaded, breakage or damage of parts may occur and weighing results are not to be depended upon. This seems, however, not to be well understood or at least not to be observed by the operators of scales designed as wagon scales. Not only is the motortruck limitation frequently disregarded but we have found scales used for weighing motortruck loads in excess of the nominal capacities of both motortruck and wagon scales. Based upon an analysis of our field records, it appears that 54 percent of the wagon scales encountered have been used in weighing motortruck loads in excess of the marked motortruck capacity of the scales or of 60 percent of their wagon capacity. In addition to these, 4 percent of the scales have been used in weighing motortruck loads in excess of the nominal wagon capacities of the scales, extra weights, either from other scales or home-made, having been secured in order to make it possible to weigh these excessive loads. In addition to the two groups of scales already mentioned, it is found that 7 percent of the motortruck scales encountered were being overloaded by amounts ranging up to 9,000 pounds. When we consider a wagon scale, however, carrying a motortruck load of 6,000 pounds in excess of its wagon capacity, the seriousness of the overloading should be apparent to all.

Digitized by Google

It has not been uncommon to find levers which have been broken and mended; I believe that in one case there was evidence of a particular lever having been broken and mended in three places, perhaps as a result of three separate failures.

We have no means of knowing what errors were being developed in the case of scales which were overloaded in use since in no case do we load a scale under test beyond its nominal capacity. In some cases scales are not even loaded to their full nominal capacity, if, in the judgment of our inspectors, scale parts might fail under such conditions.

The vehicle-scale testing unit of the National Bureau of Standards has demonstrated its adequacy for the purpose for which it was designed. We believe that the testing service which we have been rendering has disclosed conditions unknown both to scale owners and weights and measures officials. We know that this service has aroused widespread interest in the communities where it has been carried on and we have received from weights and measures officials of those jurisdictions and from scale owners enthusiastic and appreciative comments upon our work. It is very encouraging to learn that plans are already under way in some of the jurisdictions visited by our testing unit to provide suitable equipment for the routine testing of vehicle scales. Moreover, the results of our work are believed already to have extended even beyond States where we have carried on testing work; at least we know of activity along this line in a number of States which we have not yet visited.

It is the desire of the Bureau to further in every proper way the procurement of adequate testing means for vehicle scales and we shall be happy to cooperate with officials at any time in supplying detailed information upon our own equipment and in conferring with them, if desired, as to the most suitable type of equipment to fit their particular needs.

DISCUSSION OF ABOVE PAPER

The CHAIRMAN. We are very glad to see the interest that has been shown in Mr. Smith's paper and in the report that you have received. Is there discussion of Mr. Smith's paper?

Mr. BAUCOM. Mr. Smith said that he does not test any scale beyond its normal capacity. I think the manufacturers of some of the scales are guaranteeing them to carry a 25- to 50-percent overload. I am just wondering if it would be advisable or permissible to give that scale a test in excess of its rated capacity to determine whether it would go beyond its capacity and be accurate.

Mr. R. W. SMITH. The very great probability is that you will go through the platform and lever system into the pit if you start overloading scales to that extent. Another reason is that we do not believe that a scale which holds itself forth to do a certain thing should be tested beyond the point claimed for the scale. We would not want to take chances of breaking a man's scale and I don't believe weights and measures officials want to do that. That is why on certain scales having obviously weak levers or weak platforms we keep our test load down even below the nominal capacity of the scale. If you wish to conduct research of that kind I think it should be done in the laboratory or the scale shop, and not on installed equipment in the field.

Digitized by Google

Mr. HOLBROOK. I may add a word there and say that one time in testing a railroad track scale within its capacity we broke a main lever, and the amount of correspondence that was carried on over one main lever took a great deal of our time that we could better have devoted to other subjects.

I don't believe it will ever pay to test a scale over its capacity, but I do believe the State regulation should be rigidly enforced to the effect that a scale shall not be used beyond its nominal capacity.

Mr. BAUCOM. The only reason I brought that out is on account of the sales talk a salesman will put up to sell a scale to a purchaser, claiming you can overload it without any danger. The purchaser may buy a lower-rated scale believing he can overload it without damage. If the States can head that off it will help. That is more or less a policy that might be worked out in the State, but I want to throw that out for consideration.

Mr. ARCHIE T. SMITH. I would like to say a word about the conditions we found in New Jersey on the overloading of scales. Where a scale is used beyond its capacity we will so test it. Very often we find that it is inaccurate on the overload. We have gone through some scales. On one, not long ago, the platform broke right in the middle and let the truck down into the pit.

Another motortruck scale, with a concrete deck, was being used recently to its beam capacity and a sand truck went through and broke all four main levers. The scale was repaired; new main levers were installed, and our test truck was the first truck to go on that scale after it had been put back into service. During the test, while I was taking a reading on the beam, it let go again, with the result that they have to tear it out and install heavier equipment.

We have found those conditions in numerous cases. The only time we will go over the nominal capacity of the scale is when they are using it beyond that capacity.

Mr. WARNER. I think this question of advertising an overload on a scale is quite an important proposition. A great many of the State laws are upheld on the ground that violations of them are unfair practices, and certainly if a scale manufacturer advertises that his scale will carry a 25-percent overload and it does not do that, it is very unfair competition between manufacturers. I dare say that if Wisconsin had an outfit that could adequately test a scale of that kind we certainly would want to test it to the capacity advertised by the manufacturer to see whether or not they were advertising falsely. If they were and the weights went through into the pit we would have fine proof to convict those fellows when we got them into court.

Mr. ARCHIE T. SMITH. I might say that where we find wagon scales being used to more than their nominal capacity we are clamping down and not permitting them to go over that, and in numerous cases are condemning the scale entirely and requiring new, up-to-date motortruck equipment to be installed, bringing about a much healthier condition.

Mr. BOYLE. We have had a recent installation in Portland of a 24-foot-platform motortruck scale in which the concrete fabricated steel deck weighed in excess of 18,000 pounds, and I was wondering if the weight of that deck with the capacity load would create a condition which would be unusual in the scale; in other words, might not the extra-heavy deck and a maximum load overload the scale, and

Digitized by Google

create a stress that would not be present were the ordinary platform to be used?

Mr. R. W. SMITH. When a manufacturer installs a scale with a certain dead load he is supposed to put in a lever system which will safely handle the dead load in addition to the live load up to the nominal capacity of scale. That is supposed to be taken care of in the design of the levers that go into that particular installation.

Mr. BOYLE. Is there any way a local inspector can determine if that condition has been met?

Mr. R. W. SMITH. Not without an engineering computation of the entire lever system.

FUNDAMENTALS OF SCALE DESIGN

By KENNETH C. ALLEN, *Development Engineer, Dayton Scale Division, Hobart Manufacturing Co.*

Mr. President and members of the Conference: My subject, "Fundamentals of Scale Design", is indeed a broad one and it would be easily possible to spend several days in discussing the various factors which must be considered in designing scales, not only for accurate weighing, but also for permanence of accurate operation, ability to stand abuse, ease of manufacture, speed and convenience of operation, general appearance, and of course, adherence to the specifications which you men have developed during the many sessions of these National Conferences.

Since in the time allotted for this part of the program we cannot even begin to cover the field of scale design I will confine my remarks

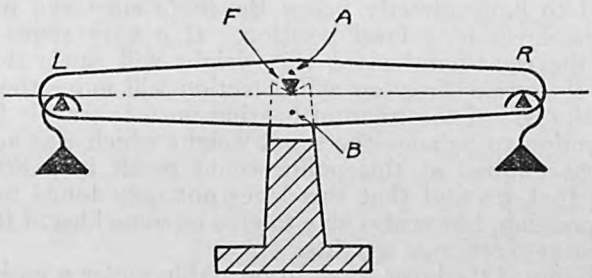


FIGURE 5.

to a simple nontechnical discussion of some of the basic principles involved in the construction of scales. To some of you these remarks may be too elementary to be of interest; however, I believe it possible that the majority of those present have, because of their executive duties, been unable to take the time necessary to delve into the theory behind these machines.

We will start this discussion with the simplest form of even-balance lever such as that shown in figure 5. In the center of this lever at point *F* we have the fulcrum knife-edge bearing on which the lever rotates. At each end of this lever are two other bearings marked *L* and *R* which are equally spaced from the center bearing and on which we may hang the weights to be compared. Since we use this type of scale by observing the effect of the weights on the normal level position of the lever, we must first make sure that the lever

Digitized by Google

will assume and maintain such a position when no weights are applied. This characteristic is controlled by the position of the center of gravity of the lever relative to its fulcrum bearing. If, in designing such a lever, we distribute its weight in such a manner as to bring its center of gravity on the axis of the fulcrum knife-edge the lever will be like a perfectly balanced wheel in that it will remain in any position in which it is placed. Such a lever will have some value for weighing operations. For example, if we applied weights to the outer knife-edges and found that the lever would remain level if we so placed it or that it would stay in any other position in which it was set, we would know that a perfect balance existed between these two weights. If, on the other hand, the lever continually tended to turn in one direction it would be obvious that the weight which was being lowered was the heavier of the two. This lever, however, would not give us any idea of how much heavier the greater weight was as it would continue to rotate to its lowest position whether the difference were a grain or an ounce.

If in the design of our lever we should so distribute the mass as to place the center of gravity above the knife edge approximately at the position *A* in figure 5, we would find it impossible to make the lever stay in position. It would be top heavy and would always tend to fall to one side or the other in the same manner as would a pencil if we tried to stand it on its point. Such a condition would render the lever practically useless for any accurate weighing operations.

In the correctly designed lever the parts would be so arranged as to place the center of gravity just below the knife edge at a position indicated by *B* in figure 5. In this case this center of gravity will always tend to hang directly below the knife edge and in so doing will hold the lever in a level position. If a very slight weight is applied to the right-hand pivot this weight will cause the lever to rotate in a clockwise direction, which action will move the center of gravity to the left of the fulcrum bearing until it travels far enough in that direction to balance the small weight which was applied. A larger weight applied at this point would result in a little greater rotation so that we find that this lever not only tends to maintain its normal position, but is also able to give us some idea of the amount of difference between two weights.

Having designed the lever so as to be stable under a no-load condition we must now consider the means of maintaining this stability when loads are applied to the end pivots. Due to the fact that the loads which are applied are free to swing on the outer knife-edge bearings their effect is the same as though they were fastened to the lever with their center of gravity on the axis of these bearings. If the load pivots are so placed on the lever that a line through them passes above the fulcrum pivot, then when we apply loads to these pivots we raise the center of gravity of the whole system and again make the lever unstable or top-heavy.

If the line between these outer pivots passes below the center knife-edge the effect is to lower the center of gravity of the lever, which condition makes the lever very much more stable and thus decreases its sensitivity. In order to avoid the two conditions just enumerated it is necessary for us to place all three pivots on the same straight line. This is known as the range line and is indicated by the broken line on figure 5. With the pivots so set, the center of gravity

Digitized by Google

of any loads which are applied to the end pivots passes through the exact center of rotation and therefore does not affect the lever action.

The effect of this range line may be more clearly explained by figures 6 and 7. In figure 6 we show the correct straight range line between the lever pivots *L*, *F*, and *R*. Since the pull of the applied weights is controlled by gravity which always acts vertically downward, their effect on the lever is governed by their true horizontal distance from the fulcrum rather than by the spacing of the pivots along the line of the lever. When the lever in figure 6 is level as indicated by the broken line *LFR* this effective distance between the outer pivots and the center is represented by the distances between *O* and *M*, and *O* and *N* on the lower horizontal line. In this case these two distances are equal to each other because the distances between *L* and *F*, and *R* and *F* are assumed to be equal and the lever is horizontal and therefore parallel to the line *MON*.

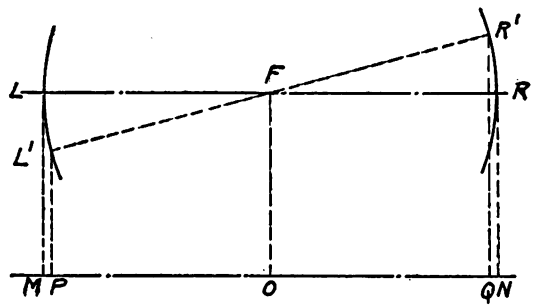


FIGURE 6.

When the lever is used in weighing it will, of course, be rotated and will assume some off-level position such as the one shown by the dotted line *L'FR'*. In this position the effective horizontal spacing of the pivots has been decreased to the distance represented by *OP* and *OQ* on the lower horizontal line. Since this range line is straight, the two sides of the lever, *L'F* and *R'F*, make the same angle with the horizontal line below and therefore result in equal projections on that line as shown by *OP* and *OQ*. Therefore, although *P* and *Q* are not as far from *O* as points *M* and *N*, they are still equally spaced from *O* and our lever still maintains its even-balance characteristics.

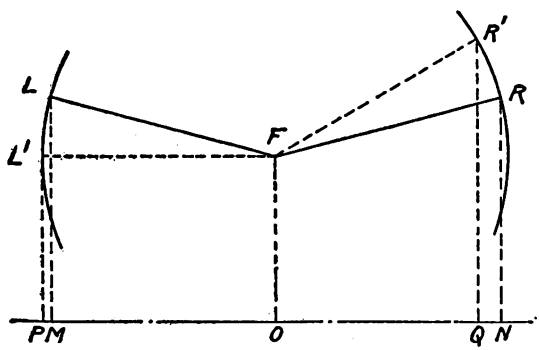


FIGURE 7.

In figure 7 is illustrated the effect of a broken range line with the pivots *L* and *R* being placed above the fulcrum pivot *F*. Here the distances from *L* to *F* and *R* to *F* are assumed to be equal and the lines between these points, when in a position shown by the straight line, are assumed to make equal angles with the horizontal. When the lever is in this position the effective arms of its two sides will be represented by the distances from *O* to *N* and *O* to *M*, which are equal and therefore indicate an even-balance lever when in this position.

Digitized by Google

If this lever is then used in weighing and is rotated to the position shown by the dotted line $L'FR'$ we will find that instead of the lever steadying itself it will tend to keep on going in the direction in which it started. If we examine the horizontal projection in this case we will find that the projection of the left side of the lever has been increased from OM to OP and that of the right side of the lever has been decreased from ON to OQ. The distance from O to P is now considerably greater than that from O to Q so that we no longer have an even-balance lever and it becomes obvious why the lever continues to rotate to the left.

The final step in the construction of an even-balance lever is the adjustment of the outer pivots so that they both are exactly the same distance from the center bearing. This is usually accomplished by setting these pivots with very accurate gages and then checking the setting by applying equal weights to the pivots and observing their effect on the lever. If the lever does not maintain its level position, further pivot adjustments are made until the desired condition exists. After this final setting is made the weights are usually interchanged on the lever in order to make sure that the weights themselves are exactly equal. If the lever still maintains its horizontal position after the weights are reversed we are then reasonably certain that the pivots are accurately set and that we will obtain satisfactory results from the lever.

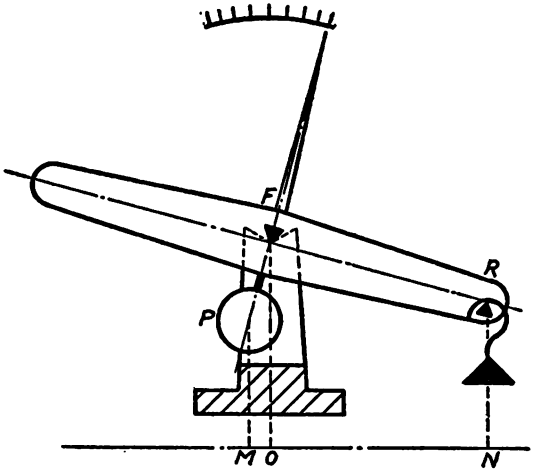


FIGURE 8.

All the principles just described for an even-balance lever also apply to uneven levers, with the obvious exception of the pivot spacing which is changed to suit the desired ratio of the loads to be applied. These principles also apply to the poise and beam systems commonly used on commercial scales. If a hanging poise is used the beam notches must all be placed on the range line so that the weight of the poise will not affect the sensitivity of the lever. The notches for the poise must also be as accurately spaced as the pivots would be on a simple lever if we expect to obtain results of comparable accuracy.

If the sliding poise is used its track must be on or parallel to the range line and the center of gravity of the poise must either be on the range line or must be placed in such a manner that the combined effect of its center of gravity and that of the lever are such as to meet the requirements of stability and sensitivity.

From the simple lever just described it is but a short step to the pendulum principle of automatic weighing. By taking the lever

Digitized by Google

shown in figure 5 and hanging a heavy weight just below its fulcrum we make this lever exceedingly pendulous. If we then add a pointer and a chart we have the fundamentals of a pendulum scale, as shown in figure 8. If a weight is hung on pivot *R* it will pull this point downward, thus rotating the whole system in a clockwise direction. This rotation will move the pendulum weight *P* to the left of the fulcrum *F* a distance equal to that between the points *O* and *M* on the horizontal line. This same action will move the pivot *R* in toward the fulcrum until it stops at some horizontal distance from the fulcrum such as ON. A balanced condition will exist when the weight of the pendulum times the distance *OM* equals the weight of the suspended load times the distance *ON*. If still more weight is added, the pendulum will move farther out until the balance is again reached. This same rotation will move the pointer along the chart and thus indicate a greater load. The chart, however, will not be evenly graduated because equal increments of load result in equal changes in the combined ratios of the distances *ON* and *OM* rather than in equal increments of rotation of the system.

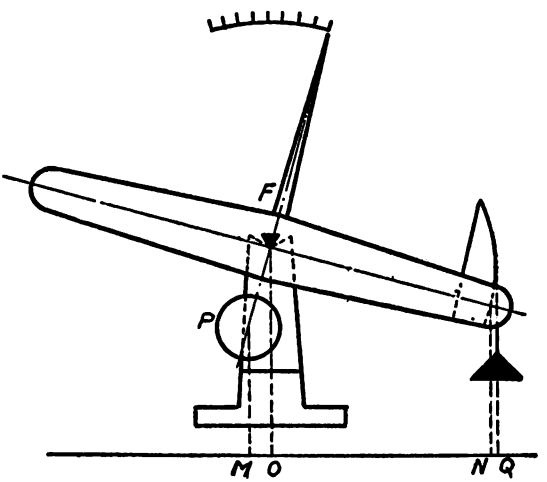


FIGURE 9.

When an evenly graduated chart is desired the necessary action can be produced by suspending the load to be weighed from a steel tape passing over a cam so designed as to make equal angles of rotation result from equal changes in combined ratios of the distances *OM* and *OQ* as shown in figure 9. It will be noticed in this diagram that the distance from *O* to *Q*, which now represents the moment arm of the applied load, is greater than the distance from *O* to *N*, which represents the effective arm of the load if the cam had not been used as in figure 8.

The procedure in designing this cam so as to obtain an evenly graduated chart is in itself a somewhat involved mathematical problem which we will not attempt to discuss here.

In spring scales, the spring alone replaces the whole pendulum system just described, thus eliminating the cam, tape, pendulum ball and pendulum knife edge. In addition, since springs resist the applied loads through their own internal stresses rather than through the aid of gravity, they are relatively insensitive to an out-of-level condition and can be made very much lighter in weight with the corresponding decrease in the inertia of the scale.

The principle of springs is so simple that no explanation of their action is required here. Furthermore, the design of a spring for scale use, both from a standpoint of proper materials and general propor-

Digitized by Google

tions, is too involved for a discussion at this time so that we will pass on to a further discussion of levers.

So far, we have considered comparative weighing in which known standards are compared with the unknown weights through levers. We have also discussed automatic means of weighing such as springs and pendulums in which the values of the weights are read directly on the chart without the use of auxiliary lever systems excepting insofar as the pendulum might be considered a form of automatic lever.

The question may now arise as to the function of levers in automatic scales, since almost all such scales use levers, although they are not theoretically required. If levers are not used it is necessary to so place the chart and weighing mechanism that the load may be suspended beneath them as in the familiar hanging dial scale. In many applications where a more compact construction is desirable the dial is placed at a lower position and the commodity platform is placed to one side or over the reading face of the scale. In such construction the lever is used to transmit the force from a point under the platter to a point under the chart.

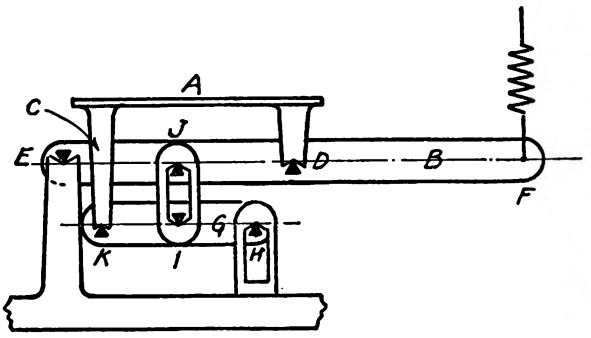


FIGURE 10.

In most automatic scales it is also desirable to have a light load on the spring or pendulum in order to reduce the size of these parts. This is accomplished with the same lever which transfers the force from one point to the other, through the spacing of pivots. In the Dayton cylinder scales, for instance, this lever has a ratio of 2½ to 1 so that a 30-pound load on the platter transmits only 12 pounds of force to the springs.

Levers such as those which are used in conjunction with springs or pendulums, are different from the even-balance levers in that they should serve only to transmit the force and decrease its amount. They should not enter into the weighing function as an even-balance lever does, but should leave the weighing entirely to the springs. These levers are therefore designed with the center of gravity on the range line, so that they do not affect the scale readings, regardless of whether they are in the upper position weighing a light load or in the lower position with a heavy load. We must, of course, still keep all of the pivots in the same straight range line in order to avoid the condition mentioned in respect to the even-balance levers.

In the systems which we have discussed so far, we have had all of our platters hanging from the lever, whereas almost all scales except the hanging type place the platter above the lever. This introduces the problem of platter control, since the platter is naturally top-heavy and will tend to overturn if some means are not provided to prevent this.

There are two methods of caring for this condition—the multiple-lever system and the check-link system. Figure 10 shows a sketch of the multiple-lever system. In this case the platter *A* is supported at

Digitized by Google

the four corners thus preventing any tendency for it to overturn. If, however, we were to attempt to support the four corners with a single lever such as *B*, the front and back legs would contact the lever at the points *C* and *D*, which points are not equally spaced from the fulcrum *E* and will not transmit equal loads to the point *F*, where the spring or pendulum would be attached. It would, therefore, give different indications of weight according to the position on the platter which the weight occupied, the reading being greater when the weight is placed on the edge of the platter nearer the spring.

To correct this condition a secondary lever *G* is introduced and the legs at the point *C* are carried around the main lever and allowed to bear on this secondary lever *G* at point *K*. This lever *G* is provided with a fulcrum bearing at point *H*. Point *I* is placed midway between points *K* and *H*. The legs at *D* continue to contact the main lever,

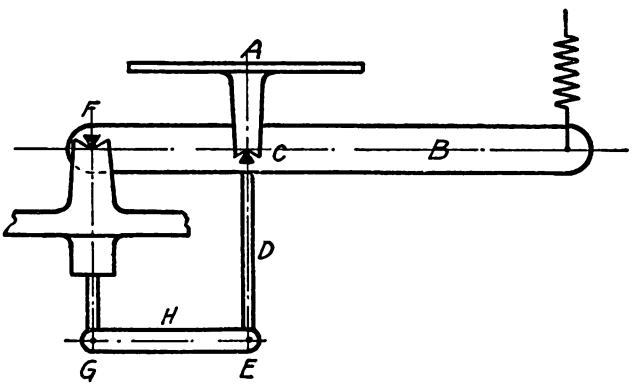


FIGURE 11.

and another bearing is provided at *J*, midway between point *D* and fulcrum *E*. Points *J* and *I* are then connected by means of a link so that the secondary lever hangs on the main lever at this point.

If we assume that the lever *B* is a 2-to-1 lever, we know that if we apply a 2-pound load at point *D* it will exert a 1-pound reaction at point *F*. Now, if a 2-pound load is placed on the platter at point *C*, it exerts a 2-pound load at point *K* on the secondary lever, which is increased to a 4-pound load at point *I*, since point *I* is midway between point *K* and the lever fulcrum *H*. This 4-pound load goes into the main lever at point *J*, midway between point *D* and the fulcrum *E*, at which point this main lever has a 4 : 1 ratio. This 4-pound load then goes through the 4 : 1 lever and appears at point *F* as a 1-pound pull, so that we find that our 2-pound weight will exert a 1-pound pull on the spring regardless of where it is placed on the platter.

A simpler system of accomplishing this result is shown in figure 11, where we have a platter *A* contacting a lever *B* at point *C*. Since this platter contacts the lever only at this one point we do not have to worry about varying ratios of the lever. It is obvious, however, that this platter is top-heavy and will not support a load unless some means be provided to stabilize it. For this purpose we extend the platter support member *D* down to a point *E* directly below *C*, and provide a connection *G* in the frame of the scale at a point directly below *F*, making the distances *FG* and *CE* equal. Between the points *G* and *E* we provide a check link, the length of which is exactly equal to the

Digitized by Google

distance between *F* and *C*. Now, any tendency of the platter to rotate is arrested by the push or pull on this check link. By adjusting the distance *FG* we bring the check link exactly parallel with the lever *B*. Under these circumstances any forces in the check link are completely balanced by the parallel forces in the lever, so that they have no effect on the weighing action of the scale. It is obvious that the farther the check link is from the lever the less will be the forces required to stablilize the platter due to the greater moment arm *CE*. This is a desirable condition, and all manufacturers of this type of scale try to get as great a distance between their lever and check link as possible in order to reduce friction and wear on these parts.

We have now discussed very briefly some of the fundamental principles involved in scale design, particularly those in which I believed you to be interested. There are, of course, many other details in scale construction such as racks, pinions, bearings, dashpots, etc., the function of which I am sure is obvious to most of you, but time does not permit any further discussion of these principles.

RECENTLY ENACTED ORDINANCE REQUIRING LICENSING OF SCALE REPAIRMEN

By Alex Pisciotta, *Deputy Commissioner, Department of Public Markets, Weights, and Measures, City of New York, N. Y.*

At the National Conference last year, the city of New York was represented by my predecessor, Hon. Matthew J. Diserio, who exhibited our new large-capacity scale-testing equipment and delivered a paper describing this equipment. In a general way, he also discussed the improvements in weights and measures enforcement in New York City. Commissioner Diserio was to appear on your program this year, to present to you a paper on the new city ordinance regulating the dealing in, trading in, selling, and repairing of used scales, weighing or measuring devices. I am happy to inform you, and I know Commissioner Diserio's many friends whom he has made among you, will be glad to hear that Mayor LaGuardia has seen fit to promote him to a higher position in his official cabinet, that of Deputy Commissioner of the Department of Sanitation.

It is somewhat of a coincidence that I, his successor, had similar previous training and experience to undertake this work. We both are members of the legal profession and both were promoted from positions in the Department of Licenses. So I speak to you now with about the same apprehension and presumption that my predecessor must have felt last year.

We have been trying in the city of New York, as elsewhere, to obtain some control over the business of dealing in second-hand scales and other weighing or measuring devices, and its related business of repairing these devices. Our inspectors frequently find, in making their inspections, incorrect scales, which, upon investigation, are found to have been purchased from second-hand dealers who have no idea of their accuracy and have neither the knowledge nor the means to determine this fact. The dealer sells the scale, "as is." There is often no representation made as to its accuracy and certainly no guarantee or warranty.

We found also that scales and measuring pumps which had been condemned by us were supposedly repaired by all kinds of people holding themselves out to be scale repairers. They have very little

Digitized by Google

knowledge of scale mechanics, often no test weights or measures, or test weights or measures which are not frequently tested for accuracy. They prey upon the unsuspecting merchant, who has purchased a used scale from a second-hand or junk dealer or at a public auction. He often makes the "repair" more extensive than is required and frequently endeavors to sell the merchant a new scale, or a rebuilt scale.

There are a number of itinerant mechanics to be found in a city like New York, who try to augment their earnings during the daytime at some regular occupation by setting themselves up as "expert scale men" or "scale experts" in their spare time. Every merchant in the city is bothered continuously by such men soliciting their business.

We had a number of cases in New York last year in which 20-pound spring scales of the type used extensively by peddlers had been tampered with by removing the 20-pound dial and substituting a 25-pound dial, thereby making it possible to defraud the purchaser ¼ pound on each pound, or 5 pounds on a 20-pound purchase.

It was with such conditions as these in mind, that our Department presented to the Board of Aldermen, an ordinance designed to correct these abuses.

The new ordinance requires that every person, firm, copartnership, corporation, or association who or which maintains or carries on the business of dealing in, selling, trading in, receiving, or engages in the repairing of condemned, rebuilt, or used scales, weighing or measuring devices, shall obtain a certificate of registration. The annual fee is $25. No certificate is to be issued to any person who is not a citizen of the United States, or who at least has not declared his intention of becoming a citizen by the procuring of his first papers. Before issuing a certificate, the Commissioner is required to cause an inquiry to be made concerning the applicant and must be satisfied with his experience and training as a mechanic with knowledge of repairing scales, weighing and measuring devices. The applicant must agree to comply with all the provisions of the new ordinance and to all the rules and regulations of the Department of Public Markets, Weights, and Measures or any other city department applicable to him or to his business.

Dealers in second-hand or used scales or weighing or measuring devices must be licensed by the Department of Licenses as second-hand dealers, in addition to registration with our Department. For that license, all such dealers are fingerprinted and their record checked with the Police Department. So you see we have a double check on all dealers who handle such scales.

Another section of the law provides that every repairer or dealer of condemned, rebuilt, repaired, or used scales, weighing or measuring devices shall, within 5 days after the making of such repairs, or the sale and delivery of a repaired, rebuilt, exchanged, or used scale or other device, serve a written notice to the Department, giving the name and address of the person, firm, or corporation for whom such repair was made, or to whom a repaired, rebuilt, exchanged, or used scale, etc. was delivered and a statement that the same has been so altered, rebuilt, or repaired as to conform to the standard specifications and regulations of the Department.

There is a section which provides that anyone who accepts a scale, weighing or measuring device, which has actually been condemned by the Department, which is intended to be dismantled or destroyed,

Digitized by Google

shall remove the condemned tag and return it to the Department with a statement describing the instrument and giving the name and address of the person from whom it was received and that it had been dismantled or destroyed.

There is a further provision that every person, firm, or corporation registered under the ordinance must keep records which shall be open for inspection by any police officer or inspector or other person authorized by the Commissioner of Public Markets, Weights, and Measures or any magistrate of the city of New York, which records shall include the name and address of every person for whom scales, weighing or measuring devices are repaired or to whom a repaired, rebuilt, exchanged, or used weighing or measuring apparatus or device has been sold or delivered.

There is a very essential requirement that every dealer or repairer of used weighing or measuring devices shall submit their testing equipment at least once a year to the testing station of the Department for comparison and calibration with the Department's standards, after which the Department shall issue a certificate of its findings as to such comparison and calibration.

A fine of not more than $100 for each offense or imprisonment not to exceed 10 days, or both such fine and imprisonment is fixed as the penalty for violating any of the provisions of the law, and the Commissioner is authorized to revoke or suspend or cancel the certificate of registration.

This law took effect March 1 and it is too soon now to judge of its effects. The legitimate, reputable scale dealers and repairers of scales, gasoline pumps, and other measuring and weighing devices welcome it. We have received excellent cooperation from them. One effect seems reasonably certain from our experience so far, that is, we have materially reduced the number of dealers in this business. When the law was signed by Mayor La Guardia, it had not received much publicity and, of course, in a city the size of New York, had not attracted much attention even from those in the trade who should have kept themselves informed of such matters.

We have gone through the telephone directories, obtained lists from available sources and have had our inspectors make a survey of places in their districts which offered used or second-hand scales or who advertised such a business in any manner. Through these means we have compiled a list of about 300 concerns who would come under the provisions of the law. Notices were sent to all of these and this was followed by departmental summons to our office to have them apply for certificates. After about 2 months we have been successful in issuing less than 100 certificates. A great many have informed us that scales are a side line and that they are discontinuing dealing in them, rather than pay the $25 fee and come within the provisions of the ordinance. Of course, this will be satisfactory to us and accomplishes one of the purposes of the law. You would be surprised to see how fast the second-hand scales disappeared from view in the display windows of second-hand dealers, junk dealers, and auction rooms. We have the means at our disposal to see that they live up to their statement and I am sure that we will be able to force them to comply or stay out of this business.

We have been receiving the notices required from those registered as to the used and repaired devices they have been delivering and have been able to send out men to check up on their accuracy.

Digitized by Google

Now that the ordinance is in effect, we confidently expect that before the end of a year, we will have every concern in the business registered and that we will be inspecting within a reasonable time all of the repairs made by them and any scales sold by them. If we can do this successfully, I feel we will have accomplished a great deal.

It is perhaps unfortunate that the law did not provide some means for the licensing or registration of all mechanics employed by the larger concerns. Of course, we shall hold the employers responsible for any irregularity on the part of any mechanic employed by a licensee. However, it might have been better if each individual mechanic who does the actual repairing had been registered. It is yet too soon to see the effect of that phase of the ordinance. If it becomes necessary, the law may be amended.

In New York City the Division of Weights and Measures, even as increased during the present administration of Mayor La Guardia, is very much undermanned, a condition which I suppose is complained of by nearly every weights and measures official in the country. It is very difficult, as you know, to make the governing authorities appreciate the value and need for this work. I must confess that I, myself, was not so greatly impressed, nor even knew about the splendid work this division was doing for the public, until I took over the work and had first hand knowledge. With our limited organization, we have a territory of over 300 square miles, over 5,500 miles of streets, and a population of nearly 7 millions. The proper supervision of the coal business or gasoline stations alone could easily occupy our entire time.

In addition to enforcing weights and measures provisions, we are now licensing coal and ice dealers, and only last Friday, a law went into effect licensing all dealers in live poultry. The enforcement of this law has also been turned over to our Division. Therefore we are not able to devote as much attention to this matter of scale and measuring device repair and the distribution of second-hand devices as we should like, but I think we are proceeding in the right direction and it will be only a matter of time when we shall have it under complete control.

On July 20, 21, and 22, the New York State Association of Sealers of Weights and Measures will hold its annual convention in New York City, at the Hotel Commodore. I shall be very glad to have as many as possible of you gentlemen who are vitally interested in weights and measures attend this convention. Elaborate arrangements have been made for your entertainment and I can assure you that the stay with us in New York will be both an instructive and a pleasant one. Mayor La Guardia of the city of New York through me extends to you all a most cordial invitation and will be very happy to greet you on that occasion.

DISCUSSION OF ABOVE SUBJECT

The CHAIRMAN. Discussion of this paper will be opened by R. E. Gould, Corresponding Secretary, Horological Institute of America. Mr. Gould will describe the way in which that Institute determines the qualifications of candidates for watchmakers' certificates.

Mr. HOLBROOK. Mr. Chairman, the application of watchmaking to scale repairing may not be immediately obvious. I may say, therefore, that in discussing the licensing of scale repairmen it was deemed to be a matter of interest to show how the watchmakers are proceeding

Digitized by Google

to regulate their own industry in qualifying men to take care of watches. In a similar way a scale repairman might be required to demonstrate his efficiency in scale repairs.

CERTIFICATION OF WATCHMAKERS BY THE HOROLOGICAL INSTITUTE OF AMERICA

By R. E. Gould, *Corresponding Secretary*

In 1921 a group of men interested in the development of the science of horology in its various phases and especially in the repair and maintenance of timepieces, met in Washington to consider ways and means of bettering the grade of work and raising the standards of the watchmaker at the bench. This conference led to the organization, under the auspices of the National Research Council, of the Horological Institute of America as a nongovernmental body with which the various Government bureaus could cooperate, but which would be self-governing and controlled by its own members. On the Advisory Council of the Institute are representatives of the National Research Council, the United States Naval Observatory, the Smithsonian Institution, and the National Bureau of Standards, as well as representatives of the horological schools, watch factories, trade journals, local horological societies, and the watchmakers at the bench. This enables the Council to consider its problems from various viewpoints and to come to decisions agreeable to all.

One of the stated objects is "To establish a system of varying attainments for watch- and clock-makers, and to issue graded certificates to such applicants as shall, through careful examinations, demonstrate their worthiness to receive them." One of the first steps taken was to establish two grades of examinations, the junior watchmaker grade for the younger and less experienced men and the certified watchmaker grade for men of longer practical experience at the watchmaker's bench. These examinations cover both the theoretical and the practical sides of watch repairing, and furnish a very good test of the applicant's ability. The grading of these examinations is done by an examining board of six experienced practical watchmakers, which meets bimonthly, generally in Washington.

Let me explain the details of procedure for conducting the examination. A watchmaker files an application for examination in the grade for which he is eligible, together with the required watch (or watches) and fee. In this application he is required to name a "monitor" to supervise his written examination and a "voucher" to oversee the repair work on his watch. In some sections, local horological societies, associated with the Institute, have appointed approved supervisory boards to assist in conducting the examinations within their respective areas, but, where no such board exists, the applicant names his own monitor and voucher, subject to approval of the Certification Committee of the Institute.

Suppose a man applies for the junior grade examination, what is the procedure? He sends in with his application a pocket watch to be mutilated and returned to him for repair. He repairs and adjusts this watch to the best of his ability. When he has accomplished this to his satisfaction, he sends the repaired watch to the Secretary. Meanwhile, the applicant has taken a written examination and returned his answers to the Secretary.

Digitized by Google

About 2 weeks before the meeting of the Examining Board all repaired watches on hand are turned over to the Time Section of the National Bureau of Standards for performance rating. When the tests are completed the watches are again returned to the custody of the Institute. They are now given to one of the examiners for detailed examination of the quality of the repair work. He takes each watch down and examines each part, making note of what he finds. He then reassembles the watches and returns them to the Secretary to be held for the meeting of the Examining Board. When the Board meets it examines the watches and papers, taking into consideration the results of the Bureau's tests and the comments of the man who made the detailed examination, and grades the applicant accordingly. If a passable grade is made on each portion of the examination, a certificate of junior watchmaker is granted and the certificate is sent as soon as it has been signed by the officers and examiners. If a man fails in either part of the examination, he is generally given an opportunity to repeat that part in which he failed.

The examination for certified watchmaker is conducted in a similar manner, only the applicant is required to repair a bracelet watch as well as a pocket watch and to set jewels in a small plate sent him with the mutilated watches. For this grade, the requirements, both in the repair work and in the written examination, are much more severe than for junior grade.

The procedure may seem rather lengthy. It generally requires about 3 months to complete either examination after filing the application. The result, however, furnishes a very fair basis for judging an applicant's ability, and it is felt that in very few cases has it miscarried. When a watchmaker obtains a certificate and displays it in his place of business, he has something to show the public to prove that he has been examined and found capable of doing good repair work.

The spread of certification in both grades since the organization of the Institute speaks for itself, and the increasing demand on the part of the public that work on watches be done by men of certified ability justifies the work that the Institute is doing toward raising the standards of repair work. A total of 1,262 junior and 568 certified watchmaker certificates have been granted, and new applications are being received regularly. There are watchmakers in either one grade or the other in every State of the Union, and in some States laws have actually been set up or are contemplated for their regulation. In Wisconsin a law has been passed requiring the licensing of watchmakers. In Illinois, Wyoming, and California bills for this purpose have been introduced in the legislatures but have not yet been acted upon.

A year's active membership is given to each watchmaker who passes either of the certification examinations, and to each member is sent the journal and news letters of the Institute. He is thus kept informed of what is happening in related fields. One does not have to be a member of the Institute to take the examinations—they are open to all qualified watchmakers.

Mr. DAVIS. A law was recently enacted in Vermont which follows along the lines of the one enacted in New York, which the gentleman from New York has just read to you. Scale repairmen were going

Digitized by Google

through Vermont and the condition was such that the men who were purchasing scales that were repaired by these men, were being imposed upon in many instances. We have two large scale manufacturing concerns in Vermont, and during the time of the depression people who had been employed there would go out trying to earn a dollar by repairing scales. Perhaps the man had been employed in a sealing room and knew something about his business, but I have known of men who had been employed in crating up those scales who tried to repair. When they were through with a scale, it was in no better condition, and perhaps was worse, than it was when they started on it. The buyer or user of the scale was being gypped, so we, through the good offices of Mr. Diserio, got a copy of this ordinance that was passed in New York, and we have followed it very closely in drafting our legislation. We are hoping that it is going to do good in Vermont.

I would like to ask the gentleman from New York what the effect would be if the scale manufacturers or the pump manufacturers were to take out licenses, and send out their repairmen who were not individually licensed.

Mr. PISCIOTTA. As the law is now it concerns itself only with the matter of licensing. The concern itself obtains the license and that license covers all the employees. That is one of the things that perhaps should not have been done. If we find that it doesn't work, later on we will amend the law to cover the individual mechanics.

Mr. DAVIS. Then you wouldn't recommend a law for examining the ability of the individual mechanic?

Mr. PISCIOTTA. If the individual mechanic makes application we inquire as to his personal character, his business connections, and his experience. He has to submit letters of recommendation from where he has worked before and where he learned the trade. In the case of the concern we investigate the type and character of the concern. If we know it is reputable and responsible, and will employ only good mechanics, we will license it. However, if we find that they do not employ good mechanics, and that they should not have been licensed, we still have the power to revoke or cancel the license, or refuse to renew the license. The power of revocation is a very strong factor in licensing in that you can practically put out of business a concern which is not what it is supposed to be.

Mr. SWEENEY. I would like to ask the gentleman from New York whether they require that the party who does the work shall keep a permanent record of the work done in order that subsequent investigations might be made by inspectors from his Department to verify whether or not proper returns have been made.

Mr. PISCIOTTA. They are supposed, within 5 days, to make a report of any measuring device or scale which they have repaired or rebuilt. We immediately send an inspector to check up on the work that has been done, to see whether the work has been properly done. If the report does not come in we have another means of catching the people who are perhaps either unlicensed or who do not make a report. The inspectors may find a peddler or a merchant with an incorrect scale. He may say, "Why, I just had the scale repaired." "Who repaired the scale?" "John Jones." We immediately go to John Jones, and if he has been licensed we check up on why he did not make a report, and if he is not licensed we prosecute him for not obtaining a license. As complaints come in we continually investigate them.

Digitized by Google

According to the law they must keep for a period of 1 year their records, and those records are subject to inspection at all times by our inspectors or the police department or by any city magistrate or other authorized person.

Mr. LEONARD. How do you determine whether a man can repair a scale or not—just from affidavits?

Mr. PISCIOTTA. You have to take a certain amount of chance with the people you license. That is true in all licensing. We try to diligently go into all his qualifications, but there is no examination provided for. There is no means of testing his ability until we have complaints from people for whom he has repaired scales. If we find he hasn't done his work properly we can revoke or suspend his license.

Mr. LEONARD. But you have no other requirement other than what the man says he has done?

Mr. PISCIOTTA. He has to submit letters of recommendation from a concern where he has been employed or from people for whom he has done work. It is left to our discretion as to whether or not the man is qualified. We give him his first chance. If he makes good he keeps his license.

Mr. LEONARD. Then, if he has an easy job and gets over the hurdle he is all right. If he runs into a difficult job it may be otherwise.

Mr. PISCIOTTA. If there is no complaint there is no objection.

PRESENTATION TO THE CHAIRMAN

Mr. FULLEN. Dr. Briggs, at this time it affords me great pleasure, as a representative of Governor James V. Allred of Texas and the Directors of the Pan-American Exposition, to present to you a scroll from Governor Allred, commissioning you as "Ambassador Extraordinary." Your duties will be to promote friendship, peace, and good will, and you will hereafter be known as El Hidaljo Lyman J. Briggs.

I understand that last year Dr. Briggs received the largest hat that he had ever had in his life. At this time a big State presents perhaps the smallest hat, but in memory of a great occasion.

Dr. BRIGGS. You will please express to the Governor and his associates my very deep appreciation of this honor.

SALESMANSHIP IN THE WEIGHTS AND MEASURES FIELD

By ROBERT L. FULLEN, *Chief Sealer of Weights and Measures, City of Dallas, Texas*

Mr. President and gentlemen of the Conference, the success of this Conference, or any conference, depends largely upon the first word of the subject which has been assigned to me for discussion—"Salesmanship"—and the success of your job and mine, as weights and measures officials, depends entirely on the success that we or others have in selling the public and public officials on the need of a weights and measures department. Whenever we have dealings with anyone, whether on matters of business or otherwise, the natural laws of salesmanship are operating, and the ultimate result—whether success or failure—depends upon the quality of the salesmanship exercised. The impressions we convey govern our success financially and otherwise.

Digitized by Google

Arousing interest.—The knowledge of the need for such service as is rendered by a weights and measures bureau is as dormant as the shriek of a wheel of a wagon when it is stopped, and, unless the buying public is awakened to some of the practices that are being carried on before their own eyes, it will stay dormant. In other words, we must pull the wagon before the wheel will squeak; on the other hand, we must impress thoroughly upon the minds of the public that there is a real need, and that without such service as we render, they face practices that are costing them money for which they are not receiving any benefits.

I believe there is not a man or a woman in the world who would not vigorously protest at being "horn-swoggled" or deliberately cheated. They will usually admit that it was not the amount so much as it was the principle involved. When one is willfully cheated, it all revolves back to that old confidence game. The prospective purchaser goes into a place of business believing he will get what he asks for and pays for, or else he would never offer to make a purchase. After all, if you arouse enough personal interest—weights and measures problems are of a personal nature—you are going to get some action. Every man and woman has a certain amount of pride which compels him or her to detest being defrauded out of a penny. So by arousing public interest you are certain to put them on the defensive. The philosophy of salesmanship is the philosophy of leadership; and the philosophy of leadership always consists in keeping the public on the defensive.

There are far too many of us who work for money or fame. There is only one legitimate purpose in life, and that is to serve humanity. A man's aim should be to serve his family, to serve the public, and to serve posterity.

Creating a desire.—After sufficient interest has been aroused, and you have shown beyond any reasonable doubt a need for a greater weights and measures bureau, or closer cooperation, you must next create a desire among your citizens. When you create a desire, you do it because of what individuals think and feel, because you have made an appeal to, and satisfied some self-interest motive. When you fail to create a desire, and therefore fail to put over your proposition, you fail to do so because of what your audience or public thinks or feels. You fail because your appeal has failed to touch the self-interest chord in the heart. In selling the weights and measures department to the public you must make sure they will derive some kind of satisfaction and benefit from the so-called purchase.

In creating a desire, you must determine what motive is first and foremost. In the weights and measures endeavor I would say that the fear of being defrauded or having to pay an excess amount of profit would perhaps be the principal motive; however, I think that many people's pride would be crushed to think they let someone cheat them right before their own eyes. Perhaps caution would be another motive. These motives are selfish ones, and selfish motives are more or less dominating in human life.

Influencing the public in favor of weights and measures.—In discussing influencing I shall use the words of Lyman Abbott, who said: "The greatest and most vital power in influencing life is personality. It is greater than law or example."

Perhaps I had better give you a definition of personality that I read some years ago: "Personality is that magnetic outward expression

Digitized by Google

of inner life, which radiates courage, courtesy, and kindness. It attracts people by producing a pleasing effect, and is a product of the development of the positive qualities; it makes a man a leader in the affairs of life instead of a follower."

A weights and measures official must at all times be courteous, kind, diplomatic, pleasant, sincere, and tactful; but at the same time he must know his business, be firm in his decisions, demand respect of himself and the weights and measures laws. An official is judged by his qualities, be they positive or negative.

In the selling of the weights and measures department, it must always be remembered that to the other man his name is the greatest name of all and that he likes to hear it. To be able to call his name is to be able to have a certain influence on him. When a person hears his name called he will listen and it much depends on what you say, or perhaps how you say it, as to how he is influenced.

In order to actually be able to put salesmanship into practice, you must be able to influence or persuade people to want something they already need, or, in other words, be able to change human needs into human wants.

You will please excuse me for a more or less personal reference, but to the press of Dallas is due a word of appreciation for more than 100 articles and many pictures which they have contributed to our local educational campaign within the last year. Commendation is also due radio station WRR for the time they contributed to our weights and measures discussions.

We, as weights and measures officials, have many human-interest stories, so let's get better acquainted with the boys of the press; give them facts and they will do the rest.

ACTIVITIES OF THE NATIONAL SCALE MEN'S ASSOCIATION

By C. R. Letzkus, *President, National Scale Men's Association*

Mr. President, members of the National Conference on Weights and Measures, ladies, and gentlemen: The members of the National Scale Men's Association appreciate the fact that you have recognized their organization by inviting its presiding officer to speak to you of the Association's activities. It is a great pleasure for me to be able to accept your kind invitation.

The National Scale Men's Association is an organization not unlike your own. It has several local chapters which are functioning in as many of the large cities. Similar to your State Associations of Weights and Measures these chapters are counted upon to deliver the proper personnel for filling the major offices of the parent body and to furnish the topics for annual meetings. The members are located in many parts of these United States and I believe the Association could rightfully be called the International Scale Men's Association since several members come from Canada. You should acquaint yourselves with the location of these local chapters so that you may join them if you wish.

The members of the National Scale Men's Association are men who are well qualified in the technical, practical, and commercial problems appertaining to scales. The Association deals only in scale problems which cover the standardization of design, test, testing equipment, inspection, repair, maintenance, and distribution. Many interesting

Digitized by Google

topics were presented before the members during the last annual meeting held in Pittsburgh, Pa., March 23 to 25, 1937.

The subject of the proposed revision of the specifications for hand-operated and automatic grain hopper scales was introduced. A committee selected from the membership of the Association was appointed to collaborate with the AREA Committee appointed by the Association of American Railroads for drafting the final revision of the grain-scale specifications. One of the members spoke on the revision of the specifications for two-section scales. He reported that the permissible loading on cast iron had been increased and the loading on steel had been decreased. Other changes consisted principally of a rearrangement of the old specifications in more logical order.

The matter of licensing scale repairmen was thoroughly discussed with the final result that a motion was passed requesting the resolutions committee to prepare a resolution to be presented at the executive session. The following is the wording of the resolution adopted by the National Scale Men's Association on this subject:

Whereas, in the practice of our art, we know of conditions prejudicial to public interest in the repairing of weights and weighing equipment for use in trade and commerce and otherwise, and

Whereas our interest as an association is identical with that of the general public; therefore be it

Resolved, That this, the National Scale Men's Association, in the twenty-first annual convention assembled in Pittsburgh, Pennsylvania, this 24th day of March 1937, does hereby record its judgment that persons engaged in the practice of installing and repairing weighing apparatus should be subject to strict examination, to registration, to permit (revocable for cause), and to bond, all under the jurisdiction of lawful authority.

A resolution was introduced and adopted which puts the Association on record as desiring an experimental research to be undertaken to establish the adequacy of materials and processes not now permitted by scale specifications, for scale pivots and bearings, and particularly to the end of determining the safe loads per inch of contact at degrees of hardness economically obtainable in shop practice. This resolution concludes as follows:

Resolved, That the National Bureau of Standards, as the outstanding institution for industrial research in the public interest, be advised of this desire by a copy of this resolution formally transmitted to the Director of the Bureau by the officers of this Association.

Many interesting papers were read before the meeting. One was on the subject "Scales and Weighing in Industry." This paper covered the use of scales from the smallest laboratory scale to the huge railway track scale during the manufacture of steel products. Two State officials gave very interesting talks on their motortruck testing equipments; one presented slides showing the equipment, the other had his equipment placed at the side of the hotel for a practical demonstration. Among other papers may be mentioned, "Motion Weighing", "Automatic Weighers, and the Elimination of Human Errors", "Weight Agreements"—concerning the problems of the weighing and inspection bureaus, "Indicators Applied to Weighing Beams", "Coupled Motion Weighing" relating to the weighing of cars coupled in motion during the handling of iron ores", and "Tolerances". A talk and slides were presented relating to "Individual Wheel Load Weighing for High-Speed Locomotives"; this is a very live topic as the Association in general is trying to learn of a more economical

Digitized by Google

design than the present very expensive and possibly not accurate scale in use. The present high-speed locomotives require an accurate record of the dead load on each individual wheel.

A motion was made and carried to permit the ladies, whose husbands are members of the Association, to use the name of the National Scale Men's Association in designating an auxiliary being formed. A lady from Texas was selected as President and a lady from Pennsylvania as Secretary. The ladies could select their own entertainment program while the annual meeting was in session. Many of the members attend the annual meeting and continue on to other parts of the country with their wives and families, thereby combining a few days of business with their vacation period.

In conclusion, I would feel remiss if I did not take this opportunity to say to the members of this Conference that during the past 15 years I have been operating one of the Bureau's railway track scale testing equipments and have worked with many of the State, county, and municipal weights and measures officials. During these pleasant associations I can honestly say here to you all that I have received whole hearted support and cooperation from each of you and it has been deeply appreciated. I have not found one of you whom I have not liked and I look forward to many more of these pleasant associations. I thank you.

Mr. BAUCOM. In view of the fact that we have a man here celebrating the twenty-fifth anniversary of his first attendance at this Conference, I move that we adjourn in honor of James A. Sweeney, of Massachusetts.

(At this point, at 12:55 p. m., the Conference took a recess until 2 p. m.)

Digitized by Google

SIXTH SESSION—AFTERNOON OF THURSDAY, JUNE 3, 1937

TOUR OF THE LABORATORIES OF THE NATIONAL BUREAU OF STANDARDS

(The afternoon session of the Conference consisted of a visit to various laboratories of the National Bureau of Standards, particular attention being devoted to the Division of Weights and Measures. Special demonstrations were given in the laboratories, designed to illustrate the character and scope of their activities. In order to make the tour of maximum interest and helpfulness, the delegates and guests of the Conference were divided into small groups, each group being in charge of a member of the staff of the Bureau.)

Digitized by Google

SEVENTH SESSION—MORNING OF FRIDAY, JUNE 4, 1937

(The Conference reassembled at 9:35 a. m., at the Raleigh Hotel, Dr. Lyman J. Briggs, President of the Conference, in the chair.)

REPORT OF THE COMMITTEE ON SPECIFICATIONS AND TOLERANCES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN, AND DISCUSSION THEREON

Gentlemen: Your Committee on Specifications and Tolerances respectfully submits the following report, recommending certain changes in several codes formerly adopted by the Conference. The reasons for the changes suggested will be set out at the time that the report is presented to the Conference for action thereon.

(Signed) F. S. HOLBROOK, *Chairman*,
CHARLES M. FULLER,
JOSEPH G. ROGERS,
JOHN P. MCBRIDE,
GEORGE F. AUSTIN, Jr.,
Committee on Specifications and Tolerances.

Mr. HOLBROOK. The detailed recommendations which I have to present this morning and which constitute the report of the Committee were distributed at the Wednesday morning session and have been in your hands since that time for consideration.

In accordance with well-established custom, it is suggested that it would be advisable if these various provisions were passed upon as read, for the reason that they refer to paragraphs widely scattered in various codes, and in frequent instances the various provisions have no relation one to another. Therefore if we act upon each of them individually as read, it will be efficient, since it will not then be necessary at the conclusion of the reading of the report to go back over the ground and duplicate the presentation, to discuss and act upon the various provisions.

(It was agreed that the Conference would proceed in the manner outlined.)

Mr. HOLBROOK (reading):

SECTION ON SCALES

A. GENERAL DEFINITIONS

Add the following at the end of paragraph A–2c:

A vehicle scale is a large-capacity scale designed to be used to determine the weight of a motor truck or wagon, loaded or unloaded.

(The definition as proposed by the Committee was duly adopted.)

Mr. HOLBROOK (reading):

B. GENERAL SPECIFICATIONS

B–2w. Shift test of scales.

The first portion of this paragraph reads as follows:

A scale having four main-load bearings shall give results correct within tolerance when a load of one-quarter capacity or less is placed so that its center of gravity lies over any one of the main-load bearings, as indicated by the points designated 1 in the following diagram, and when a load of one-half capacity or more is so

Digitized by Google

placed at the center of any quarter of the platform, as indicated by the points designated 2 in the following diagram.

Amend the above material to read as follows:

A scale having four main-load bearings shall give results accurate within tolerance when a load of one-quarter capacity or less is placed so that its center of gravity lies as nearly as may be over any one of the main-load bearings, as indicated by the points designated 1 in the following diagram, and when a load of one-half capacity or more is so placed at the center of any quarter of the platform, as indicated by the points designated 2 in the following diagram: Provided, however, That in the case of a vehicle scale the results on any corner may be in error by twice the allowable tolerance, but the algebraic mean of the errors on the two corners at one end of the scale shall not exceed the tolerance.

There are two amendments in that. The first is formal. The words "as nearly as may be" are added. We know it would be extremely difficult to place a load so that the center of gravity would exactly lie over the main-load bearing; it should be placed so that it will lie approximately over the main-load bearing.

The second amendment is very much more important. This, you will see, doubles the tolerance on a corner of a vehicle scale, but requires the end of the scale to be within the present tolerance.

The Committee is of the opinion that a vehicle scale will never be used with only one corner loaded. It is perfectly obvious that when one drives a vehicle onto a vehicle scale both of the corners at the end of the scale are loaded. We have heard at this Conference and at the meeting last year, discussions on corner testing versus end testing of vehicle scales. The end testing of vehicle scales is coming into more general use. Now of course, sometimes a corner test is advisable, especially when the testing load is inadequate, because putting the whole load upon one corner stresses that corner to the greatest degree possible with the available load, and helps to disclose errors that might otherwise not be detected. However there seems to be no good reason why either corner, if not too much in error, should not be allowed to have an error somewhat greater than was formerly allowed, provided that the two corners at one end of the scale taken together, do not develop an error greater than the normal error now allowed upon test. This idea is provided for in the language I have read to you.

(The specification as proposed by the Committee was duly adopted.)

Mr. HOLBROOK. I might make the general remark here inasmuch as the several following provisions also refer to vehicle scales, that these amendments which we are now proposing are being made as a result of the vehicle-scale test work of the National Bureau of Standards, which has been described to you in detail earlier in the Conference.

In making our tests and in writing up our reports we have been impressed by the fact that the sensibility reciprocal requirements and the tolerances of the Conference could safely be liberalized in some respects; if this is the case it is particularly desirable to improve them at this time if possible, before the first annual report on the work of the vehicle-scale test unit is made by the National Bureau of Standards. If any amendments which are adopted here are applied to the tests which we have made so far, and if it is hereafter unnecessary to make any further changes in the tolerances, then it is perfectly obvious that the results of our work year by year will be directly comparable with the results on the work done theretofore; whereas were any changes in tolerances made after one or more annual reports had been issued

Digitized by Google

and those new tolerances were applied thereafter, the various annual summaries would not be directly comparable, which would be an unfortunate situation.

The next amendment suggested is as follows:

I. SENSIBILITY RECIPROCAL (SR) REQUIREMENTS

I–1. For large-capacity scales.

This paragraph reads as follows:

The maximum SR allowable on a large-capacity scale, at the capacity of the scale or at any lesser load, shall be the value of two of the minimum weighbeam graduations: Provided, however, That the manufacturers' maximum allowable SR, or the maximum SR allowable on a new large-capacity scale, shall be the value of one of the minimum beam graduations.

Amend the above material to read as follows:

The maximum SR allowable on a large-capacity scale, at the capacity of the scale or at any lesser load, shall be the value of two of the minimum weighbeam graduations, except that the maximum SR allowable on a vehicle scale shall in no case be less than 10 pounds: Provided, however, That the manufacturers' maximum allowable SR, or the maximum SR allowable on a new large-capacity scale, shall be the value of one of the minimum beam graduations.

The amendment to that paragraph fixes a minimum value of 10 pounds for the maximum allowable SR on vehicle scales at present in use, but the requirements for new scales are unchanged. The present maximum sensibility reciprocal allowable on vehicle scales in use having 2½-pound graduations is doubled; the only SR values which are affected by this provision are those on vehicle scales having a minimum graduation of 2½ pounds or less.

Mr. BAUCOM. Mr. President, I would like to make this observation: You have made this general in its application. Now what is a large-capacity scale? Is the inspector to decide when the 10-pound value is applicable. Previously we have been given a value equal to two graduations; the manufacturers have decided upon the graduations and it worked very nicely. I am wondering, if we set up a specific value and apply it in general, whether we will at any time run into trouble.

Mr. HOLBROOK. The values for the maximum sensibility reciprocal on all large-capacity scales except vehicle scales are unchanged. The values for the maximum sensibility reciprocal allowed on vehicle scales are unchanged except that a minimum value of 10 pounds is specified. Thus the SRs on scales having a minimum graduation of 5 pounds or more are not affected. The only change that is made by this amendment is that the minimum value of the maximum sensibility reciprocal allowable on vehicle scales having a graduation of less than 5 pounds is made 10 pounds, instead of the value at present in force.

The value at present in force in the case of a 2-pound scale is 4 pounds, and in the case of a 2½-pound scale is 5 pounds. Our results on vehicle scales tested so far show than an extremely small percentage comply with the requirement which I have mentioned, and we think the requirement unnecessarily severe.

Mr. BUSSEY. If I understand Mr. Holbrook, he intends this to apply to vehicle scales only, while the specification says "large-capacity scales." All large-capacity scales are not vehicle scales.

Mr. HOLBROOK. The body of the paragraph refers, as formerly, to all large-capacity scales and present requirements remain in force in relation to all large-capacity scales, except vehicle scales. You will note that the language of the proviso reads, "except that the maximum

Digitized by Google

SR allowable on vehicle scales shall in no case be less than 10 pounds"; thus the new minimum is specifically limited to apply to vehicle scales.

(The requirement as proposed by the Committee was duly adopted.)

Mr. HOLBROOK (reading):

J. TOLERANCES

J–1. For large-capacity scales.

The first proviso under paragraph J–1a reads as follows:

1. On a beam scale, the tolerance shall in no case be less than the value of one of the minimum beam graduations.

Amend this material to read as follows:

1. Except as is provided herein, the tolerance on a beam scale shall in no case be less than the value of one of the minimum beam graduations; on a vehicle scale, when a load of test weights of not less than 8,000 pounds is employed in any test, the tolerance shall in no case be less than one of the following values: 5 pounds on a scale having a minimum graduation of 2½ pounds or less; 10 pounds on a scale having a minimum graduation of 5 or 10 pounds; 20 pounds on a scale having a minimum graduation of 20 pounds.

This will require a little explanation. The National Bureau of Standards is, as I think all of you will agree, a conservative institution. The Bureau does not desire to go throughout the country and declare very large percentages of scales to be inaccurate unless, in the case of each scale so reported, the error developed is such an error that in our best judgment we feel that the scale should, in fact, be classed as an inaccurate weighing machine.

Now there have been various reports of tests sent in by our inspectors in the case of which, on the data shown, it was necessary, under a strict application of the tolerances of the Conference, to call a scale inaccurate when in our opinion, the scale was a reasonably satisfactory weighing machine. In general, we are wedded to the tolerance of 0.2 of 1 percent on a scale in use. For many years the National Bureau of Standards has used such a tolerance as a criterion of the accuracy of railway track scales and we are convinced that the tolerance of 0.2 of 1 percent is, in general, a perfectly satisfactory tolerance for large-capacity scales, including vehicle scales. However, when a scale is tested at light loads relatively insignificant errors may cause the scale to exceed a flat tolerance of 0.2 of 1 percent, due to the fact that the percentage is being computed upon a small quantity.

For instance, in our vehicle scale test report no. 31, on a 40,000-pound-capacity scale, we found that one error only was outside of the tolerance of 0.2 of 1 percent; this error was 10 pounds on a load of 3,000 pounds, a percentage error of 0.33 percent. The minimum graduation on the weighbeam was 5 pounds. Under our present requirements the minimum tolerance was 5 pounds—one of the minimum graduations on the beam. Thus the tolerance was exceeded and it was necessary to classify the scale as inaccurate due to the fact that on this small load of 3,000 pounds we had an error of more than 0.20 percent. Under the proposal as presented that scale would now be called an accurate scale.

Another instance: Here is scale report no. 352, on a 20,000-pound scale. One error only was found to be in excess of the present tolerances. That error was 3 pounds on a 1,000-pound load, resulting in a percentage error of 0.30. The minimum graduation on the weigh-

Digitized by Google

beam was 2½ pounds; thus under our present requirements the minimum tolerance was 2½ pounds, and therefore the scale appears as an inaccurate scale, because it had an error of 3 pounds on 1,000 pounds. Mind you, in both of these cases, with all heavier loads the scales were correct within 0.2 of 1 percent.

It is inadvisable to raise the minimum tolerance in the case of all tests. If a weights and measures official is using an inadequate test load—and under present conditions the great majority of sealers in the United States are using an inadequate test load—these small errors on the small loads cannot safely be overlooked. For, suppose that a sealer's total test load is 1,000 pounds (unfortunate as that may be, it is often the case). Suppose further that when he puts this test load on the scale, an error of 10 pounds is developed. That is an error of 1 percent. If the minimum tolerance which he may enforce against that scale is 10 pounds, then he would necessarily be required to call that scale accurate although if that error of 10 pounds on 1,000 pounds was a straight multiplication error, as it should be, he would be allowing an error of 400 pounds on 40,000 pounds, which would be an indefensible error for the sealer to allow. Therefore, we propose to increase these minimum tolerances only in cases where adequate test loads are used and where the essential accuracy of the scale at the higher loads has been demonstrated in the test made.

I think that perhaps is an adequate explanation, but I would be glad to go into it further if the delegates desire further information.

(The tolerance paragraph as proposed by the Committee was duly adopted.)

Mr. HOLBROOK (reading):

The second proviso under paragraph J–1a reads as follows:

2. On an automatic-indicating scale, the tolerance on the reading face shall in no case be less than the value of one of the minimum graduations on the reading face, or one five-hundredth of the capacity of the reading face, whichever is less, except that when the minimum graduation on the reading face is 1 pound or more such tolerance shall in no case be less than 1 pound.

Amend this material to read as follows:

2. Except as is provided herein, the tolerance on the reading face of an automatic-indicating scale shall in no case be less than the value of one of the minimum graduations on the reading face, or one five-hundredth of the capacity of the reading face, whichever is less, except that when the minimum graduation on the reading face is 1 pound or more such tolerance shall in no case be less than 1 pound; on an automatic-indicating vehicle scale, when a load of test weights of not less than 8,000 pounds is employed in any test, the tolerance shall in no case be less than one of the following values: 5 pounds on a scale having a minimum graduation of 2½ pounds or less; 10 pounds on a scale having a minimum graduation of 5 or 10 pounds; 20 pounds on a scale having a minimum graduation of 20 pounds.

That merely applies the same requirements to an automatic-indicating scale that have already been explained in the case of beam scales.

(The tolerance paragraph as proposed by the Committee was duly adopted.)

SECRETARY'S NOTE.—No change in the third proviso was recommended by the Committee to the Conference. However, after a subsequent review of the provisions it is indicated that this proviso should be modified somewhat in order consistently to carry out the purpose of the amendment made in proviso 1. Proviso 3 reads as follows:

3. On an automatic-indicating scale, the tolerance on any weighbeam and the tolerance on ratio shall in no case be less than the minimum value specified in the preceding proviso, or the value of the minimum graduation on any beam with which the scale may be equipped, whichever is less.

Digitized by Google

In order to harmonize the several provisos it appears necessary to modify this language to make it read as follows:

3. On an automatic-indicating scale, the tolerance on any beam and the tolerance on ratio shall in no case be less than the minimum value specified in the one or the other of the preceding provisos, whichever is less.

In view of the nature of the change, it is considered that this may be made without formally referring the matter to the Conference.

Mr. HOLBROOK (reading):

The fourth proviso under paragraph J–1a reads as follows:

4. The tolerance on new scales shall in no case be less than one-half of the tolerance value arrived at by the operation of provisos 1, 2, or 3.

Amend this material to read as follows:

4. The tolerance on new scales shall in no case be less than one-half of the tolerance value arrived at by the operation of provisos 1, 2, or 3, except that the special minimum tolerance values specified therein to apply to vehicle scales only, shall not be employed in computing the values of the tolerances on new vehicle scales.

The effect of this provision is to make the increase in minimum tolerances applicable only to scales in use; new vehicle scales are subject to the same tolerances as heretofore.

(The tolerance paragraph as proposed by the Committee was duly adopted.)

Mr. HOLBROOK (reading):

Table II under paragraph J–1a reads as follows:

TABLE II.—*Tolerances for large-capacity scales*

Load [3]	Class A [1]		Class B [2]	
	Tolerance on ratio [4]	Tolerance on weigh-beam, reading face, or unit weight indications	Tolerance on ratio [4]	Tolerance on weigh-beam, reading face, or unit weight indications
Pounds	*Ounces*	*Ounces*	*Ounces*	*Ounces*
0 to 99, inclusive	½	1		
100 to 199, inclusive	1	2		
200 to 299, inclusive	2	4		
300 to 399, inclusive	3	6		
400 to 499, inclusive	4	8		
500 to 599, inclusive	5	10	10	20.
600 to 799, inclusive	6	12	12	24.
800 to 999, inclusive	8	16	16	32.
1,000 and over	½ lb. per 1,000 lb.	1 lb. per 1,000 lb.	1 lb. per 1,000 lb.	2 lb. per 1,000 lb.

[1] "Class A" scales include all large-capacity scales which are not specifically included within "Class B."

[2] "Class B" scales include only the following: Scales of the railway-track, motortruck, and wagon types; and also scales of the dormant, self-contained, and built-in types which are not installed inside of a building having side walls and roof, and which are consequently exposed to weather effects and sudden changes of temperature.

[3] The amount of weight on the load-receiving element of the scale.

[4] The ratio is the multiplying power of the scale. This tolerance is applied to parts requiring the employment of removable weights.

Digitized by Google

Amend this table to read as follows:

TABLE II.—*Tolerances for large-capacity scales*

Load [3]	Class A [1]		Class B [2]	
	Tolerance on ratio [4]	Tolerance on weighbeam, reading face, or unit weight indications	Tolerance on ratio [4]	Tolerance on weighbeam, reading face, or unit weight indications
Pounds	*Ounces*	*Ounces*	*Ounces*	*Ounces*
0 to 99, inclusive	½	1		
100 to 199, inclusive	2	2		
200 to 299, inclusive	3	4		
300 to 399, inclusive	4	6		
400 to 499, inclusive	5	8		
500 to 599, inclusive	7	10	13	20.
600 to 799, inclusive	8	12	17	24.
800 to 999, inclusive	11	16	22	32.
1,000 and over	¾ lb. per 1,000 lb.	1 lb. per 1,000 lb.	1½ lb. per 1,000 lb.	2 lb. per 1,000 lb.

[1] "Class A" scales include all large-capacity scales which are not specifically included within "Class B."
[2] "Class B" scales include only the following: Scales of the railway-track type; and also scales of the dormant, self-contained, and built-in types which are not installed inside of a building having side walls and roof, and which are consequently exposed to weather effects and sudden changes of temperature.
[3] The amount of weight on the load-receiving element of the scale.
[4] The ratio is the multiplying power of the scale. This tolerance is applied to parts requiring the employment of removable weights.

The essential differences in those two tables is that the tolerance on ratio of a class A scale is increased from ½ pound per 1,000 pounds to ¾ pound per 1,000 pounds, and the tolerance on ratio on a class B scale is raised from 1 pound per 1,000 pounds to 1½ pounds per 1,000 pounds, and the values in the body of the table are recomputed on those bases.

The tolerances on scales having a weighbeam are, as you know, 0.1 of 1 percent and 0.2 of 1 percent, for class A and class B scales, respectively. The tolerances on the ratio of scales using counterpoise weights have formerly been 0.05 of 1 percent and 0.1 of 1 percent, respectively, or half of the tolerances allowed on scales with weighbeams. The reason the tolerance on ratio of scales utilizing counterpoise weights is smaller than the tolerance on a weighbeam or reading face is, that the weights themselves must be allowed a tolerance and there will be an error on the indication of the scale equal to the algebraic sum of the error on the multiplication ratio and of that resulting from the use of the counterpoise weight.

A thorough examination of this subject indicates that the percentage error which will be contributed by the counterpoise weights will be in the neighborhood of 0.05 of 1 percent. In the case of a class B scale, if we require a ratio to be accurate within 0.10 percent and require the weights to be accurate within 0.05 percent, the maximum error on the combination will not exceed 0.15 percent, which value is

Digitized by Google

to be compared with the tolerance on a beam of 0.20 percent. By increasing the ratio tolerance to 0.15 percent, to which may be added a tolerance on weights amounting in general to approximately 0.05 percent, we will have the scale using counterpoise weights and the scale having a weighbeam on the same basis so far as tolerances are concerned.

I think perhaps that is a sufficient explanation.

(The tolerance table as proposed by the Committee was duly adopted.)

Mr. HOLBROOK (reading):

K. GENERAL REGULATIONS

K–1. Maximum lading.

This regulation reads as follows:

A scale shall not be used for weighing loads greater than its nominal or rated capacity.

Amend this material to read as follows:

K–1.—Lading.

K–1a. Maximum.—A scale shall not be used for weighing loads greater than its nominal or rated capacity.

K–1b. Minimum on vehicle scales.—A vehicle scale shall not be used for weighing loads of less than 1,000 pounds.

In explanation of this regulation, I may say that in our work with the vehicle-scale test unit the men operating the equipment were instructed to find out from the scale owner and record on the field record the range of weights which the scale was used to determine. We found some very extraordinary statements in relation to the range of tare weights and the range of gross weights on vehicle scales in use. For instance, on test no. 210, which refers to a motortruck scale having a capacity of 20,000 pounds, we find that the range of tare weights being determined upon the scale was 25 to 6,500 pounds, and the range of gross weights was 25 to 14,000 pounds. Upon the admission of the owner of the scale we have a 20,000-pound motortruck scale used to weigh loads of 25 pounds. Such a condition is so ridiculous as to need no comment. In many other cases the reports indicate that scales are being used in weighing loads for which they were not designed, with the result that the percentage errors may be tremendous even though the scale complies with all applicable tolerances.

After giving the matter very serious consideration, the Committee has come to the conclusion that States might reasonably enforce a regulation to the effect that vehicle scales should be used for weighing loads only of 1,000 pounds or more. It is considered that a vehicle scale is not a proper scale for weighing loads of less than 1,000 pounds.

It occurs to us that a coal yard, for instance, which is going to sack coal, certainly needs another weighing machine in addition to its vehicle scale to determine the individual weights of bags of coal. To put a vehicle scale to such a use may innocently result in tremendous percentage errors which should not be countenanced.

Mr. SWEENEY. I am in thorough agreement with what the Secretary is driving at. However, suppose we pass upon a heavy-capacity type of scale and find it within the tolerances. By enforcing the regulation suggested would we be in any way abridging the rights of the man who has that scale which we as sealers have duly tested and sealed as being correct? If a load is weighed on that scale which is greater than the

Digitized by Google

graduations, would we have any right to abridge the rights of that man to use that scale?

(At this point Mr. Cullen, Vice President of the Conference, assumed the chair.)

Mr. HOLBROOK. I understand Mr. Sweeney's question to be: "If a sealer seals a device as satisfactory, may its use be limited?" I might call attention to an existing regulation of the Conference that provides that the value of the minimum graduation on a scale used in the retail sale of foodstuffs shall not exceed 1 ounce. In other words, Mr. Sweeney will seal many scales having 2-, 4-, and 8-ounce graduations, but with a regulation of that kind in effect he will limit the use of scales having a graduation of more than 1 ounce; he will not allow them to be used in the retail sale of food. If Massachusetts enforces regulations in relation to prescription scales, as I presume they do, Mr. Sweeney will doubtless decline to permit the druggist to use his counter scale, designed to weigh commodities in bulk, in putting up his prescriptions.

Similarly, I think there is no question but what the sealer of weights and measures by regulation has a right to limit the use of vehicle scales to loads of not less than 1,000 pounds. The suitability of equipment for its intended purpose must be given consideration by the weights and measures officials if they are going to enforce laws properly.

Mr. SWEENEY. Well, Mr. President, I merely raised that question because the thought came to me in reference to public weighmasters, who use vehicle scales. If anyone brought them a load which approximated 800 or 900 pounds, weighing it on that scale would be a violation of the regulation.

Mr. HOLBROOK. Certainly the public weighmaster who is issuing certificates of weight should use his equipment properly; perhaps he would be charged with a greater duty to use his equipment properly than the ordinary merchant, because he is going to certify a weight. He certainly doesn't want to certify an incorrect weight.

Mr. HAMMON. In the State of Idaho a great many vehicle scales are used as stock scales. Most of the scales have from 1- to 2½-pound graduations on the beam. If we attempted to enforce this regulation, what would our stock dealers do when they attempt to buy one animal?

Mr. HOLBROOK. He should provide a satisfactory scale for weighing loads of less than 1,000 pounds. The mere fact that this thing is done does not make it right. We know that it is done; we think that it is not right; that is why we propose the regulation.

The stockman who is selling one animal does not want to have the weight of the animal determined to an accuracy of 10 or 20 pounds because that is much too large a percentage of the weight of the animal.

Mr. SOLBERG. Then if we adopt this suggestion it seems to me we are placing even our stockyards in our big terminals in a very embarrassing position. In South St. Paul we inspect scales every 30 days and we pass them if they are within tolerance, but I venture to say that 50 to 75 percent of the stock bought is weighed in lots of less than 1,000 pounds. And it isn't only there, but throughout the whole State of Minnesota we have hundreds of these scales on which individual cattle are bought, weighing less than 1,000 pounds, from veal calves up, and if we place a restriction of this kind on them you can readily see that we are imposing a tremendous imposition.

Digitized by Google

Mr. HOLBROOK. I would answer that by saying that I think it a tremendous imposition upon the seller to weigh one animal on a 40,000-pound scale, perhaps, which was never designed to weigh one animal. The mere fact that a stockyards provides only one scale does not cause them to weigh one animal correctly on the scale which they have. My idea is that in case lots of less than 1,000 pounds are to be weighed, a smaller scale should be provided.

However—and this is not intended to destroy the validity of my argument that a scale should not be used for weighing loads for which it is not intended—a stockyards scale is not included within the provisions of this regulation, because this regulation refers only to vehicle scales and a stockyards scale is not a vehicle scale.[5]

(At this point, Dr. Lyman J. Briggs, President of the Conference, assumed the chair.)

THE CHAIRMAN. Gentlemen of the Conference, I have a great personal pleasure in presenting to you at this time a gentleman who is thoroughly in sympathy with the idea of complete and effective cooperation between the States and the Federal Government, reserving to the States in the full their duties and responsibilities in that regard. I present the distinguished Secretary of Commerce, the Hon. Daniel C. Roper.

ADDRESS BY HON. DANIEL C. ROPER, SECRETARY OF COMMERCE

I extend greetings to the delegates to the Twenty-Seventh National Conference on Weights and Measures. You are here from thirty-two States and have been taking part for several days in studies and discussions, looking to more effective coordination of essential services to the American public. This is in recognition of the joint responsibility of the Federal, State, and municipal governments and industry to perfect closer uniformity in methods, mechanisms, and procedures.

The National Bureau of Standards of the United States Department of Commerce is honored to be the sponsor of this Conference. A wide diversity of related interests is represented in this group of outstanding scientists, manufacturers, and public officials. This is as it should be and justifies our confidence that your labors will contribute further to needed exactness in dealing with the public. In these times our lives must be adjusted to a mechanical era. The mechanisms of this period must be so utilized as to safeguard exactness in equity, and meet the requirements of increasing consciousness of responsibilities to the people. It should be encouraging to you as it is to me that we are cooperatively endeavoring to meet this challenge of trusteeship.

The National Bureau of Standards is equipped in mechanics and in its expert personnel as a great scientific workshop. Its mission is to cooperate with you and all others throughout our country charged with like responsibilities to ours.

To begin with, the home of the Bureau is ideally located for serene thinking and sound conclusions, on 56 acres of beautifully landscaped grounds overlooking this great Capital City. Its staff, untiring in the pursuit of studies and experiments, is delighted at all times to serve the Federal, State and municipal governments, and industrial agencies which seek and need our assistance in solving problems they them-

[5] The discussion of the report of the Committee on Specifications and Tolerances is continued on p. 90 et seq.

Digitized by Google

selves have found not to yield to their own treatment. It is not the purpose or desire of this Bureau or of the Government which supports it, to take over the studies and responsibilities of outside units working along similar lines. Our purpose is to conform to statutory requirements and to stimulate and coordinate the thinking and action of all concerned for the best results for all. We recognize that many of the problems lying in your field in these complicated times are subject to analysis and solution only through combined resources and efforts. In meeting such conditions, the conference method such as you have inaugurated is the most effective procedure. It brings to bear the talent, training, and experience of all for the solution of the problems. I therefore congratulate you on the purposes of your coordinated conferences and look forward as already stated to increasing value from such meetings as you are holding here this week.

May I state, for our uniform understanding, briefly, at this point, the functions of the National Bureau of Standards as they have been outlined by the Congress of the United States. These are: The development, construction, custody, and maintenance of the reference and working standards used in science, engineering, industry, and commerce; their intercomparison, research connected with standards, and the determination of physical constants and the properties of materials. Under the organic act, the Bureau exercises these functions "for the Government of the United States; for any State or municipal government within the United States; or for any scientific society, educational institution, firm, corporation, or individual within the United States engaged in manufacturing or other pursuits requiring the use of standards or standard measuring instruments." This reflects the broad intent of Congress in providing for the Bureau's services.

The primary duty of the Bureau is to maintain for every industry, derived standards based on the national standards. The setting up and maintenance of derived standards is just as exacting as the establishment of the basic standards. The Bureau must even anticipate the need for new types and kinds of standards, and, therefore, it conducts research in all the fields of standardization and measurement so as to keep ahead or abreast of the requirements of industry, as to range, accuracy, or variety.

For example, a few years ago, few of us could have dreamed of the necessity of a standard of radio frequency good to 1 part in 5 million. Yet, the broadcasting of such a standard is now a routine function of the Bureau. Nearly 300,000 tests were completed by the Bureau last year covering almost every object from medical thermometers to cement. These have contributed to the progress and happiness of the human race.

The 400 scientists who patiently and efficiently are carrying forward the research work of the National Bureau of Standards do not noisily herald their achievements, to be sure. Therefore, the public is not generally conversant with the vast activities that are being carried forward behind the scenes for safeguarding them against fraud. There is much drama in our scientific laboratories that does not penetrate beyond the walls of these research institutions, yet the public is the beneficiary of indispensable protective services.

In this highly competitive era, with the consuming public more discriminating and more exacting in its demands than ever before, honesty on the part of the seller is not only the best policy but the

Digitized by Google

only policy that will retain confidence and build trade volume. Competition itself, therefore, is an influential factor in enforcing honest weight and measure standards. Yet, there are always willful minorities who, through subterfuge and camouflage, take unfair advantage of their customers. It is this group that must be brought and kept within terms of the law.

It seems remarkable to me that we have been able to maintain a reasonable degree of uniformity in regulations without the benefit of a central authority. This has been made possible by understanding and intelligent coordination of rules and regulations on the part of States and municipalities.

We cannot regard this system as perfect but these local units of government must be encouraged to assume a greater share of the responsibility for uniformity so that enforcement of regulations will not become a function of the Federal government alone. Therefore, the major problem is the consideration of plans for a better degree of uniformity in plans and in enforcement. This does not mean that a single pattern is imperative, but that each governmental unit should exercise its initiative in setting up the procedure that these conferences decide to be most effective in promoting the objective of honest and reasonably uniform standards and uniform enforcement.

In our planning and research, we should think in broad, national fashion and not solely in local, community fashion. Our States in fact have exercised too little initiative in this regard.

Lack of economic research information resulted in a great handicap for the States in cooperating with the Federal Government in dealing with problems of economic reconstruction, following the recent economic collapse. Only a few States were in position to show what procedure was wise and necessary in their localities. Thus, we need scientific research, as well as scientific planning not only to meet current conditions but to be prepared to cope with future emergencies.

Uniform legislation and regulations throughout the country looking to this end are necessary. Such information is needed more under emergency conditions than during normal times. Therefore, we should recognize the wisdom of action on the part of Federal and State Governments in keeping alive scientific research.

In this manner, basic information can be kept current for softening the shock of economic stress and as a nucleus for carrying forward further necessary scientific action. The best approach to this program in the interest of stabilized national safety is to broaden our thinking and action in terms of the Nation in its sphere as a composite unit. Segmentary thinking is not an effective instrument for mutual progress. Most of our problems are national in scope. Therefore the results for which you are striving cannot be adapted effectively to the sole advantage of a State or community which you represent individually. They must be thought out and solved in the light of national needs. Hence, the importance of the uniformity in the structure of legislation in the set-up of scientific units and the objectives of all.

This consciousness of our interdependence in our scientific research will prompt us to demonstrate statesmanship qualities in science, in manufacturing, and in supervision. Cooperative thinking and endeavors create the momentum that gives impetus to the progress of our Nation. That should be the objective of all. I am sure it is your objective.

Digitized by Google

The CHAIRMAN. Mr. Secretary, I assure you that the Conference is deeply indebted to you for being with us this morning. We only regret that you cannot stay with us, but we know the many obligations that rest on your shoulders.

(At this point, Mr. Cullen, Vice President of the Conference, assumed the chair.)

Mr. GRIFFITH. May I interrupt the proceedings just a moment to offer a motion of thanks to the Secretary of Commerce for the wonderful address he has just delivered, and in doing so remark that of the several Secretaries I have had the pleasure and privilege of hearing, this was the most constructive message that has ever been given to the Conference. I move you, sir, that this Conference record its appreciation by a vote of thanks to Secretary Roper, and that the same be recorded in the minutes; and further, that a copy of that address be mimeographed as soon as possible and delivered or sent to all of the members of this Conference for use in their work. It has provided me with more arguments than I have ever thought of for working out a State department in Maryland.

(The motion was passed by a rising vote.)

THE USE OF VEHICLE SCALES IN THE HIGHWAY PLANNING SURVEY

By EDWARD H. HOLMES, *Highway Engineer Economist, Bureau of Public Roads, United States Department of Agriculture*

Before considering the use of vehicle scales in the highway planning survey, it is perhaps desirable to outline very briefly just what the highway planning survey consists of, since I doubt if many of you are familiar with the details of this work.

This highway planning survey is a detailed study of the existing highway facilities, of their use and of their financing, now being conducted by 40 States in cooperation with and under the direction of the Bureau of Public Roads, United States Department of Agriculture. The survey is divided into three broad phases. First, the road inventory, which requires a complete and detailed study of roads as we now find them with respect to their width, surface type, condition, and various other details, and, as well, a record of the cultural development alongside them. It might be observed that while many States have a fair knowledge of their State systems, not one knew prior to this survey even the total mileage of local roads.

With the completion of the physical inventory, we are in the second broad phase of the survey conducting studies of the movement of traffic over the roads of the several highway systems. In this traffic survey we not only determine the total number of vehicles which use these systems, but also classify them as to whether they are local or foreign, as to their type and, in the case of commercial vehicles, as to their size, body type, and the loads they carry. Further studies show the origins, destinations, and lengths of trips of both passenger and commercial vehicles.

Then with the knowledge of our highway facilities and the use that is made of them, we make careful investigation of the financial structure which has made the highway system and its use possible. These financial studies not only include a detailed examination of the accounts of the highway departments to determine the sources of revenue

Digitized by Google

and the direction of expenditures on the various highway systems within each State; they also include a study of the location of all motor vehicles and the use which the owners of these vehicles make of the various highway systems. They will determine the extent that the average city motor-vehicle owner uses the city streets and the rural highways, both State and local, and also the use which the rural owners make of their own local roads and of the city streets. And the financial studies include as well a detailed examination of the whole tax structure of the State and its local subdivisions to permit a comparison of the source and distribution of highway taxes compared to all other expenditures.

Then in a further general study, we are investigating the life expectancy of the various highway surfaces which we find in our highway systems, as a means of determining how long we may expect our present system to last under its present and anticipated use.

The use of the vehicle scales in connection with this planning survey, as you might expect, is in connection with the study of traffic, and particularly of commercial vehicles. I use the word "vehicles" advisedly in this connection because the pit scales are actually for that purpose, to study vehicles, as distinguished from traffic. We have, scattered throughout all the States, many stations which are operated on a regular schedule, once every 26 days by parties equipped with portable scales. These parties are determining for commercial vehicles the origin, destination, trip length, commodity carried, total load of the vehicle and, where possible, the weight of the carried load. These studies, when interpreted by the data from the numerous traffic-counting stations, will give with a very fair degree of accuracy figures on what we may call the flow of weight over State highway systems, or in other words, the total weight of commodities moved, the nature of the commodities, and some idea as to the number of vehicles utilized in this movement. This we may call a study of the truck traffic.

As distinguished from this study, as I said before, we are studying in more detail at the pit scales the individual vehicles which make up the traffic. Since we are not concerned with the total movement over various routes, we need a relatively few pit scales, if they are carefully located, so as to provide a fair sample of the vehicles used throughout the State. To cite a specific State, for example, we have in Ohio three pit scales. Many of you undoubtedly are familiar with Ohio. One scale is in the eastern part of the State not far from Youngstown at which we can study the type of vehicles used in that section of the State, where there are a preponderance of heavy loads, particularly coal and products of the nearby steel industries. In the northern part of the State, not far from Fremont, we have a scale located on route U. S. 20 at which we obtain samples of vehicles, largely common carriers and contract haulers, engaged usually in a general freight movement. Then in the western part of the State near Vandalia there is a third scale at which we study vehicles largely engaged in moving the products of agriculture. We have thus at three locations in that State provided means for a detailed study of the vehicles engaged in moving various products typical of the State of Ohio.

In the different States we find pit scales of various types. Most States prefer the so-called motor-truck scales, large enough enough to

Digitized by Google

accommodate the entire vehicle. The length of the platform in such cases is generally 34 feet and the capacity of the scale is seldom less than 30 tons. A number of States, however, have installed what we call axle-loading scales in which the length of the platform is but 3 or 4 feet as against a width of 10 feet, it being understood that the 3-foot dimension is parallel to the center line of the highway. The capacity of these scales is generally 15 tons. A few States have installed a still different type of scale which we call a dual-platform type, and which permits the weighing of individual wheel loads. The length of these platforms is generally 5 to 8 feet, their width 5 feet, and they are installed about a foot apart. The capacity of each platform is at least 10 tons. Each of these types of scales has its peculiar advantages and usually the type is determined by the laws in the particular State. A State, for instance, which limits the loads on the highway by restrictions on the weight of the entire vehicle is generally more inclined to install the full platform scale, so that a vehicle can be weighed in one operation. Other States, however, whose load limit is based on the weight of the individual axle, sometimes prefer the axle-loading scales.

These scales generally have been installed as Federal-aid projects, and as such the installation has been under the supervision of the State highway department and the Bureau of Public Roads. The specifications have provided for a level apron on either end of the platform in order that we may be assured that the vehicle is level when weighing individual axles. The platform is located at a sufficient distance from the edge of the pavement to insure safety for the passing traffic, as well as for those concerned with the weighing operations. Surfaced runways approaching and leaving the platform insure that no vehicle will be required to stop on the highway while waiting to be weighed.

The scale houses have been provided by the States, and vary in character and appointments with the desires and resources of the various States. They range from a mere protecting shelter for the scale beam to an almost pretentious brick house equipped with a fireplace, and with the surroundings carefully landscaped. The weight indication is sometimes by means of a dial, and sometimes a scale beam, and in some instances a recording device is included, especially where it is proposed to eventually utilize the scales for enforcement purposes.

We have in this way installed or will have installed 85 pit scales, which added to 54 already installed in the various States, prior to this survey, gives us a total of 139 stations at which this pit-scale study will be conducted. These stations are operated daily, each scale being used for a 6 weeks' period, generally three times a year to insure the sampling of vehicles which might be operated only during certain seasons. The information obtained is by no means confined to a determination of the total weight of the vehicle. We determine, in addition, the weights of the individual axles, the size of tires, the length, width and height of the vehicle, and information on the rated capacity, the registered capacity, and the actual gross load rating assigned to the truck by the manufacturer as it appears on the specification or caution plate.

The use of this information is probably almost self-evident. However, I should like to review the use we propose in connection with these surveys.

Digitized by Google

We are very definitely not using them for purposes of enforcement. We are merely collecting data on which the States may base their future programs of legislation and of highway design. For purposes of design, we need to know the loads the highways and bridges will be required to sustain, which means an analysis not only of the total weight of the vehicles, but of the individual axle loads, and how these loads are distributed as shown by our wheel base and tire size data.

It is, however, to provide a basis for equitable regulation and taxation of these vehicles that the information will have its greatest value. For the first time, we will have accurate knowledge of what the effect will be of limitations on the weight of vehicles, or on their length, width, or height. We will be able to determine what vehicles are most generally used in the hauling of certain commodities, and whether certain regulations will hinder or favor the movement of one or more commodities with respect to others. And we will know for the first time how the loading practice conforms to the registration limits, how it conforms to the manufacturers' ratings, how we can best bring all three into conformity, and assess motor vehicle fees on an equitable basis.

The use of these vehicle scales will not be concluded with the completion of our present program of field work. In fact, their use should become more important as time goes on. Once adequate and equitable regulations are made effective, it will be necessary to continue their rigid enforcement. If we are to preserve our tremendous investment in our highway systems, and if we are to maintain and extend these systems as we shall, we must by a continuous campaign of education and enforcement insure that loads in excess of those for which the surface is designed will be excluded from the highways, and that each vehicle owner pays in motor-vehicle fees an amount commensurate with the use he receives from our highways. We anticipate that the trend will be toward more intelligent legislation and regulation in all the States, following the lead of the newly organized Bureau of Motor Carriers of the Interstate Commerce Commission in its regulation of interstate carriers. It is to prepare for this end that we are cooperating in and encouraging the installation and use of the vehicle scales.

DISCUSSION OF REPORT OF THE COMMITTEE ON SPECIFICATIONS AND TOLERANCES—Continued [6]

Mr. SAMENFINK. In New York State the Governor recently signed a bill in regard to weighing coal, which may put all the small coal dealers that we have in Rochester, N. Y., out of business. Under the new act anything over 100 pounds will have to be weighed on a vehicle scale that can weigh gross, tare and net. I think, when that new act is considered, it is really going to put a burden upon the dealer if this regulation goes through that you can't use a vehicle scale to weigh loads of less than 1,000 pounds.

Mr. HOLBROOK. This regulation is merely to the effect that a vehicle scale shall not be used for weighing loads of less than 1,000 pounds. The light weight of a vehicle presented to a vehicle scale is almost invariably over 1,000 pounds. This regulation does not prevent the weighing on a vehicle scale of 500 pounds of coal, for instance, on a vehicle. The vehicle is tared on the scale, and its

[6] For previous discussion of this report see pp. 75 to 84.

Digitized by Google

weight is more than 1,000 pounds; the gross weight of the vehicle when the coal has been loaded is also necessarily more than 1,000 pounds; the difference between the gross and tare weights may be less than 1,000 pounds without any violation of this regulation, since the loads weighed upon the vehicle scale have not been less than 1,000 pounds in the case cited.

Mr. SAMENFINK. Under our new law, anything weighing over 100 pounds must be weighed by a licensed weighmaster on a scale that will weigh gross, tare, and net. In other words, if somebody ordered 400 pounds of coal, under the old act it could be weighed 100 pounds at a time. Under the new act that cannot be done.

Mr. HOLBROOK. Will you have any vehicles used in the distribution of coal which weigh less than 1,000 pounds?

Mr. SAMENFINK. I am not saying we have, but it could be possible.

Mr. HOLBROOK. Well, vehicles used in the sale of coal will normally weigh more than 1,000 pounds, in which case they may be weighed upon a vehicle scale. What we are trying to eliminate is, for instance, the sacking of coal in 100-pound sacks on a 40,000-pound vehicle scale.

Mr. SAMENFINK. I brought up the question of a scale having a capacity under 1,000 pounds.

Mr. HOLBROOK. Such a scale would not be a vehicle scale. A vehicle scale is a scale which is designed to be used in the weighing of wagons or motortrucks, by definition.

Mr. SAMENFINK. Mr. Sweeney said that anything weighing 25 pounds, such as a bag of coal, would not be allowed to be weighed on that scale.

Mr. HOLBROOK. The vehicle scale cannot be used for weighing loads of 25 pounds.

Mr. SAMENFINK. That is what I am trying to bring out. As I said, I don't think it is fair not to let them use that scale under 1,000 pounds.

Mr. HOLBROOK. What—a 40,000-pound scale? Do you believe in weighing of loads of 25 pounds on a 40,000-pound scale?

Mr. SAMENFINK. You have a tolerance of so many pounds.

Mr. HOLBROOK. Your scale may be legally in error by 10 pounds, and 10 pounds on a 25-pound load is 40 percent. Do you believe the weight of a load should be in error by 40 percent?

Mr. SAMENFINK. No, I don't.

Mr. HOLBROOK. That is what the regulation is designed to accomplish—to prevent excessive errors in small loads due to the large minimum tolerances on vehicle scales.

Mr. SAMENFINK. I get your point; I know what you mean.

Mr. O'KEEFE. If you inserted the word "gross" in there, would it help the gentleman? I am thinking of the gentleman over here talking about his cattle. That would include your vehicle, and so forth.

Mr. HOLBROOK. Well, the gross load would be a load of the vehicle plus the load on the vehicle, and these scales will often be used in weighing the tare loads of the vehicle also. If we use the words "gross load" we do not cover that.

Mr. O'KEEFE. Must the net load be 1,000 pounds?

Mr. HOLBROOK. The net load may be 500 or 250 pounds, provided it is on a vehicle. That is reasonable, because if you tare the vehicle

Digitized by Google

on the scale and then weigh a load of 500 pounds on the vehicle, it is probable that the errors in the two weights caused by an error in the scale will tend to cancel each other.

Mr. O'KEEFE. I am not going to try to tell you what to do, but I think the wording could be clearer.

Mr. MILLER. In the State of West Virginia we have livestock scales located at various points, a very fine selection, of capacities running from 10,000 to 20,000 pounds with graduations of 2½ or 5 pounds. I will venture to say that 50 percent of all the drafts that go over this type of scale are from 100 to 1,000 pounds. What I would like to know is, would this scale come under that amendment? If so, would we be in a position to compel them to put in an auxiliary scale? We have one auxiliary scale at the largest auction. They make all their light weights on the scale, and I think that is the proper method, but will we be able to compel the other fellows to put those in when we have sealed and approved their scales?

Mr. HOLBROOK. I think you should. However, if there is a fence around the platform, the scale is not within the purview of the regulation under discussion, since it is obviously not a vehicle scale. A vehicle could not be presented and weighed on it; it is not designed for weighing a vehicle.

Mr. MILLER. They are large stock scales, and if you take the fence away there would be no difficulty in running a large truck on them.

Mr. HOLBROOK. I would say that a scale with a fence around it and with cleats on the platform is designed to weigh stock on the hoof and would not be a vehicle scale under our definition.

Mr. MILLER. I wanted to know, because 50 percent of those weights are under 1,000 pounds.

(The regulation as proposed by the Committee was duly adopted.)

Mr. HOLBROOK (reading).

K–6. Weight graduations on food scales.

This regulation reads as follows:

The value of the minimum weight graduations on a scale equipped with a weighbeam or reading face, used in the sale of foodstuffs at retail, shall not exceed 1 ounce: Provided, however, That this shall not apply to a scale used exclusively in the sale of vegetables.

Amend this material to read as follows:

K–6. Weight graduations on scales.

K–6a. Food scales.—The value of the minimum weight graduations on a scale equipped with a weighbeam or reading face, used in the sale of foodstuffs at retail, shall not exceed 1 ounce: Provided, however, That this shall not apply to a scale used exclusively in the sale of vegetables.

K–6b. Vehicle scales.—*The value of the minimum weight graduations of a vehicle scale equipped with a weighbeam or reading face shall not exceed 20 pounds.*

(The regulation as proposed by the Committee was duly adopted.)

Mr. HOLBROOK. We have now completed that portion of the report which refers solely to vehicle scales and will take up various proposals relating to scales in general. The first refers to the section comprising the definitions and is concerned with the definition of sensibility reciprocal. It reads as follows:

A. GENERAL DEFINITIONS

A-2b (3). SR of equal-arm scales, and of unequal-arm scales without trig loop.

This paragraph reads as follows:

The change in load required to move the lever system from its position of equilibrium when the scale is in proper balance to a position of equilibrium at

Digitized by Google

either limit of its motion. Provided, however, That when the scale is properly equipped with a well-designed special balance-indicating device—such as, for instance, an indicator cooperating with one or with a series of graduations, or two indicators which move in opposite directions—which device does not directly indicate weight values, the SR is the change in load required to cause a relative change in the position of rest of the indicating elements equal to 0.04 inch or to one graduated division whichever is the greater.

Amend the above material to read as follows:

The change in load required to move the lever system from its position of equilibrium when the scale is in proper balance to a position of equilibrium at either limit of its motion: Provided, however, That when the scale is properly equipped with a well-designed special balance-indicating device comprising two indicators which move in opposite directions, the SR is the change in load required to cause a relative change in the position of rest of the indicators equal to 0.04 inch. (See also paragraph A–2b (4).)

NOTE.—The parenthetical reference, "(See also paragraph A–2b (4).)" should also be added at the end of paragraph A–2b (2).

Add a new paragraph to read as follows:

A–2b (4). SR of scales equipped with over-and-under indicators.—In the case of a scale equipped with device comprising an indicator cooperating with a single balance-indicating or "zero" graduation, the SR is the change in load required to move the indicator from its position of equilibrium when the scale is in proper balance to a position of equilibrium such that there is a clear interval between adjacent edges of the indicator and of the graduation, equal to the appropriate value in the following table:

Class of scale	Clear interval
	Inch
Small-capacity scales	0.04
Large-capacity scales other than vehicle scales	.12
Vehicle scales	.25

In the case of a scale equipped as above with a device provided with a series of graduations which do not directly indicate weight values, the SR shall be as defined above, or the specified movement shall be increased to a value equal to one division on the graduated scale if this value is greater than that first specified.

This definition is designed to require that scales with over-and-under indicators be properly sensitive; that is, to require a movement of the weight indicator such that it can readily be seen for the various classes of scales. In other words, this requires that there be a satisfactory movement of the indicator to denote in proper cases that the load is over or under the load represented by the weighing elements of the scale.

Mr. BOYLE. Mr. President, I would like to ask if this amendment relates to small over-and-under scales, such as would be used for packaging crackers. Also, I would like to ask concerning a scale originally designed with a 1-pound beam by quarter ounces, and afterward fitted with an auxiliary beam with graduations representing one twenty-fifth of an ounce. Should the sealer in a test subsequent to the addition of the special tare beam apply any new SR or tolerance other than that applied on the first test?

Mr. HOLBROOK. This specification does not refer to scales having over-and-under indicators with graduated faces representing weight indications. Such a scale, under our definitions, is an automatic-indicating scale. This specification merely refers to over-and-under indicators cooperating with a single graduation representing a balance condition, or with a series of graduations which do not directly indicate in terms of weight.

In relation to your second question, as to whether SRs and tolerances are changed when a more finely divided beam is attached to a scale, I would say that putting such a beam on the scale will probably

Digitized by Google

result in reducing the SR and in reducing the minimum tolerance, because those values are functions of the minimum graduation and the minimum graduation will, in the instance you have cited, have been reduced.

Mr. BOYLE. Would a scale used in packaging crackers be construed as one weighing food for retail sale, inasmuch as the weighing operation is the only weighing of the individual package? Later on, however, a number of packages are gathered together and they are reweighed in lots, say, of 20 or 24 pounds.

Mr. HOLBROOK. I would say that a scale in a factory which is used for weighing small amounts of food in individual packages would be a scale used in the retail sale of food products. However, I think many sealers do not test these, perhaps on the ground that the sale is not immediate. The remedy is perhaps to apply proper regulations to the individual packages and to see to it that reasonable tolerances on packages are not exceeded. Doubtless under many of the State laws the official would have the power to test such scales.

Mr. BOYLE. In Maine we have no commodity tolerance on food or fuel.

(The regulation as proposed by the Committee was duly adopted.)

Mr. HOLBROOK (reading):

B. GENERAL SPECIFICATIONS

B–2m. Weight indicators on automatic-indicating scales.

B–2m (4). Clearance.

The first portion of this paragraph reads as follows:

The clearance between the index of the indicator and the reading face shall not exceed 0.06 inch in the case of all automatic-indicating scales. * * *

Amend this material to read as follows:

The clearance between the index of the indicator and the reading face shall not exceed 0.06 inch—except as is provided in paragraph B–2m (5)—in the case of all automatic-indicating scales. * * *

Add a new paragraph to read as follows:

B–2m (5). Magnified weight indicators.—*When in normal usage any weight indicator and reading face are necessarily viewed or may be viewed as magnified by means of a lens system, the requirement of paragraph B–2m (4) as to maximum clearance between the index of the indicator and the reading face shall be that the specified maximum clearance shall be reduced in inverse proportion to the angular magnification of the lens system.*

NOTE.—Specification "D-2b. Indicators" under the heading "Computing Scales" contains the same requirement as to clearance in relation to weight and value indicators. This specification should be amended and a new specification added to make these requirements consistent with the material as amended above.

In relation to these amendments I may say that it was called to the attention of the committee by Mr. Baucom that when a magnifier was used the parallax errors on scales were increased. It had not occurred to the committee that that would be the fact.

We referred this question to the Optics Division of the National Bureau of Standards and the Optics Division stated, after some inves-

Digitized by Google

tigation, that the parallax error would be increased roughly in the same proportion as the image was increased in size; that is, the parallax error would be multiplied by a factor representing the angular magnifying power of the lens. In other words, if one looked at a chart and indicator without a magnifier and found that the parallax under a stated set of circumstances was ½ ounce, then if a magnifying device with a multiple of two was placed on the scale, the parallax would be increased approximately to 1 ounce. In view of this it appeared to the committee that in the case of a scale using a magnifier the indicator should be required to be closer to the chart in order that the parallax error might not be increased, and these amendments are designed to apply to that requirement.

Mr. SMITHERS. What would be the ruling in the case of a concern selling gold who supplied their own magnifying device, the angular magnification of which was four? The scale is tested by a sealer, the distance between the indicator and the reading face is checked, and found to be excessive. What would happen in such a case?

Mr. HOLBROOK. An adjustment of the clearance to meet terms of this specification.

(The specifications as proposed by the Committee were duly adopted.)

Mr. HOLBROOK (reading):

Add a new paragraph to read as follows:

B–2y. Over-and-under indicators.—*An over-and-under indicator which does not directly indicate weight values, whether it is integral with or is attached to a scale, shall conform to the requirements of sections B–2j, B–2k, B–2l, B–2m, and B–2n, insofar as these requirements are applicable.* The attachment to a scale of an over-and-under indicator which directly indicates weight values shall be construed as constituting such scale an automatic-indicating scale, and all requirements for such scales shall apply accordingly.

The latter portion is retroactive because it is considered to be merely a restatement of present requirements.

(The specification as proposed by the Committee was duly adopted.)

Mr. HOLBROOK (reading):

F. PRESCRIPTION SCALES AND BALANCES

F–1. Application.

Add the following at the end of this paragraph:

The specifications and tolerances for class A prescription scales and balances shall also apply to scales used in the purchase and sale of gold, insofar as they are applicable.

It was called to the attention of the Committee that this Conference had no specifications and tolerances for scales used for the purchase and sale of gold, although we know that the purchase and sale of gold has been a very popular traffic since the value of gold in terms of our dollar has been increased. It seemed to the Committee that the specifications and tolerances for class A prescription scales were such as properly to be applicable to a scale used for the purchase and sale of gold. This paragraph is intended to make all class A specifications

Digitized by Google

and tolerances for prescription scales applicable to scales and balances used in that particular service.

(The requirement as proposed by the Committee was duly adopted.)

Mr. HOLBROOK (reading):

SECTION ON WEIGHTS

The table of tolerances for weights in the avoirdupois system reads as follows:

Avoirdupois System

Weight	Tolerance, weights for equal-arm scales, ratio 1:1	Tolerance, counterpoise weights for multiplying-lever scales		
		Ratio less than 100:1	Ratio 100:1 and less than 1,000:1	Ratio 1,000:1 and over
Pounds	*Grains*	*Grains*	*Grains*	*Grains*
50	100. 0	60. 0	40. 0	20. 0
25	60. 0	36. 0	24. 0	12. 0
20	60. 0	36. 0	24. 0	12. 0
15	40. 0	24. 0	16. 0	8. 0
10	40. 0	24. 0	16. 0	8. 0
8	30. 0	18. 0	12. 0	6. 0
5	30. 0	18. 0	12. 0	6. 0
4	20. 0	12. 0	8. 0	4. 0
3	20. 0	12. 0	8. 0	4. 0
2	15. 0	9. 0	6. 0	3. 0
1	10. 0	6. 0	4. 0	2. 0
Ounces				
10	10. 0	6. 0	4. 0	2. 0
8	5. 0	3. 0	2. 0	1. 0
5	5. 0	3. 0	2. 0	1. 0
4	5. 0	3. 0	2. 0	1. 0
2	3. 0	1. 8	1. 2	0. 6
1	2. 0	1. 2	. 8	. 4
½	2. 0	1. 2	. 8	. 4
¼	1. 0	. 6	. 4	. 2
⅛	. 5	. 3	. 2	. 1
1/16	. 5	. 3	. 2	. 1
1/32	. 5	. 3	. 2	. 1
1/64	. 2	. 12	. 08	. 04

Amend this table to make it read as follows:

Digitized by Google

Avoirdupois Weights

Weight	Tolerance, weights for equal-arm scales	Tolerance, counterpoise weights for multiplying-lever scales
Pounds	*Grains*	*Grains*
50	100. 0	----------
25	70. 0	----------
20	60. 0	----------
15	40. 0	----------
10	40. 0	20. 0
8	30. 0	18. 0
5	25. 0	13. 0
4	25. 0	12. 0
3	20. 0	10. 0
2	15. 0	8. 0
1	10. 0	5. 0
Ounces		
10	8. 0	4. 0
8	7. 0	3. 0
5	5. 0	2. 0
4	4. 0	2. 0
2	3. 0	1. 0
1	2. 0	1. 0
½	2. 0	1. 0
¼	1. 0	----------
⅛	0. 5	----------
1/16	. 5	----------
1/32	. 5	----------
1/64	. 2	----------

You will note that this table is proposed to be very much simplified. It becomes a two-column instead of a four-column table. While there was a reasonable fundamental basis for setting up different tolerance values for counterpoise weights to be used upon scales having various ratios, nevertheless, this resulted in specifying tolerances for weights to be used on scales having a ratio of 1,000:1, which we consider to be unenforceable in the field.

I will take one instance. By referring to the last column of the original table we find the tolerance on a 1-pound weight intended to be used on a scale having a ratio of 1,000:1 and over was 2 grains. The weights in the hands of the sealers in field work are weights conforming to class C tolerances. The class C tolerance is 1 grain. This tolerance on a commercial weight is, then, only double the class C tolerance. We would have this situation: We would have the sealer attempting to determine an error on the weight with a weight which might be in error by 1 grain, on a field portable balance which had a sensibility reciprocal of approximately 1 grain and an error of arms which was indeterminate. The possibility that he will be able to enforce a 2-grain tolerance on a commercial weight under such circumstances is, in the opinion of the Committee, negligible. Therefore, we have simplified this table by specifying only one tolerance on counterpoise

Digitized by Google

weights for multiplying-lever scales regardless of their ratio, and that series of values is one-half of the series of values allowed for weights for use on even-arm scales. It is five times the series of tolerance values allowed for class C weights.

In the opinion of the Committee most of those tolerances can be enforced on the balances and with the class C weights in use, although, even here, on very small weights where the tolerance is only 1 grain considerable difficulty may be experienced in enforcing the values specified.

(The tolerance table as proposed by the Committee was duly adopted.)

Mr. HOLBROOK (reading):

G. PERSON WEIGHERS

G–3c. Weight indications.

G–3c (1). General.

The material under this heading reads as follows:

G–3c (1). General.—A person weigher shall be so designed and constructed that it is susceptible of giving weight indications at all points between zero and capacity: Provided, however, That a person weigher may have an interval between zero and some definite weight value throughout which weight values are not given, but in this case the person weigher shall be so designed and constructed that whenever the weight on the platform is such as to fall within this interval, any coin inserted will be returned to the user through automatic delivery to a suitable receptacle on the outside of the person weigher, or the insertion of a coin in the coin slot will automatically be prevented.

Amend by making the above material nonretroactive.

We believe the character of this requirement is such that it should not be applied to scales that are in use but only to new scales hereafter put into use.

(The amendment as proposed by the Committee was duly adopted.)

Mr. HOLBROOK (reading):

SECTION ON VEHICLE TANKS

Specification 5 reads as follows:

5. Indicators.—*An indicator shall be provided within the fill opening of each compartment, which shall be located approximately midway between the ends of the compartment. The indicator shall be so designed that it will clearly, distinctly, and unmistakably define the height to which the compartment must be filled in order to contain its marked capacity. If this indicator is adjustable it shall be so constructed that it can be sealed in such a manner that its position cannot be changed without destroying or mutilating the seal.*

Amend by adding the following words after the word "capacity" in line 5:

and the change in height of the liquid surface at the index of the indicator equivalent to the volume representing the tolerance on the compartment capacity, shall in no case be less than 0.04 inch.

Vehicle tanks customarily employed at the time this specification was adopted had domes which extended a considerable distance above the top of the tank, the indicator was located in this dome, and the sensitiveness of the indication was governed by the diameter of the dome, which was reasonably small. Thus a sensitive indication was provided.

With the advent of streamlined vehicle tanks the indicator may now be located at such a point that it contacts the surface of the liquid within the shell of the compartment. Under such circumstances the sensitivity of the indication is very greatly decreased because the area of the top surface of the liquid is very greatly increased.

Digitized by Google

It appears that a tank should not be sealed unless an amount of liquid equal to the tolerance produces such a change in height of the liquid surface that it is readily appreciable on the indicator provided. This amendment sets up a criterion of 0.04 inch change in vertical height of the liquid to represent the volume equal to the tolerance on the compartment of the tank being tested. If some such requirement is not enforced we may have tank wagons in use the accuracy of which can not be measured within the tolerance provided.

Mr. RAGLAND. I want to transmit to our secretary an amendment.

Mr. HOLBROOK. Mr. Ragland proposes the following amendment:

Amend specification 5 by adding a new sentence to read as follows:
The minimum dimension of the fill opening shall not be less than 10 inches.

Do you want to explain that amendment, Mr. Ragland?

Mr. RAGLAND. I will be glad to. Gentlemen, I am heartily in favor of the proposed amendment. With due respect to our Tolerance Committee, they haven't gone far enough. This amendment is for the sake of the field man. On steamlined trucks the domes sometimes are made only 6 inches in size, and it is impossible for men to get their hands into the dome to apply the seal to the indicator.

Mr. HOLBROOK. It occurs to me that this amendment should be made to some specification in relation to the fill opening, rather than to the specification referring to the indicator.

Mr. RAGLAND. That is perfectly agreeable to me, sir. I noticed that this specification referred to the fill opening and I thought that would be a good place to give some idea of how large that fill opening should be. Let's give the inspectors plenty of room to seal since we require the indicator to be sealed.

The ACTING CHAIRMAN. Suppose we dispose of the Committee proposal and then consider Mr. Ragland's amendment.

Mr. RAGLAND. It is entirely satisfactory to me.

Mr. BAUCOM. Mr. President, I address my remarks to the Committee amendment. We have about 150 of these big transport tanks carrying around 4,000 gallons, a good many of them single-compartment. If you are going to require only a twenty-fifth of an inch it won't even be seen. I don't think that is sufficient.

I have drawn up here an amendment to that, in order that it might be perfectly clear as to what that amendment means. I propose that we should amend by changing the added words to read: "and the surface upon fill of the compartment shall be so reduced in area that the change in height of the liquid surface, at the index of the indicator equivalent to the volume representing the tolerance on the compartment shall in no case be less than 0.04 inch." That is, when you fill up this 4,000-gallon tank the area at the indicator ought to be drawn down so small that the tolerance allowed on the 4,000 gallons would be readily observed. As we now have it, with a single indicator in the middle, the change in the height of the surface is only about 1 inch for 50 gallons. I am wondering if the thirty-second of an inch proposed is adequate. I know it is said a minimum, and we can make it more. Can we condemn a tank if a manufacturer abides by that requirement?

Mr. HOLBROOK. The Conference has gone on record many times in its specifications to the effect that 0.04 inch is readily detectable, and this applies the same criterion that is applied in the case of many other devices. So far as the language of the amendment is concerned,

Digitized by Google

the committee proposal was considered to be a satisfactory statement. Mr. Baucom's suggestion is just different language which I think is intended to mean the same thing. I take it the requirement is the same.

Mr. BAUCOM. It is the same thing, only I found that a good many didn't clearly understand what we were driving at and I was trying to make it a little clearer. I don't know whether you want to substitute that.

Mr. FOSTER. Does this mean that the dome of the compartment must be large enough to take care of the expansion, so that at your sealing point the surface of the liquid will be up in the dome instead of in surface of the compartment?

Mr. HOLBROOK. The requirement for expansion space remains as in the present specification.

Mr. FOSTER. I understand that, but will this require that the compartment have a dome sufficiently high so that the liquid will remain above the shell point?

Mr. HOLBROOK. The volume representing the tolerance must result in a change in height of 0.04 inch. That must be true regardless of where the indicator is placed. We make no requirement as to the placing of the indicator, but we require that the indication be a satisfactorily sensitive one.

Mr. FOSTER. That being the case, it will be necessary to make the dome sufficiently large to take care of the expansion.

Mr. HOLBROOK. That would probably be the result, Mr. Foster.

Mr. SWEENEY. Mr. President, it appears to me that a proper correction for conditions that might exist in the future would be that the minimum capacity of the dome should bear some relation to the value of the compartment itself, the object in view being to have the dome large enough to allow for the proper expansion of 0.75 percent. We have several vehicle tanks at the present time where the indicators are in the body of the compartment and of course the proper filling of that is liable to bring about a discussion, especially when the tank is not on a level surface.

Mr. HOLBROOK. The size of the dome is not regulated except as it will be incidentally regulated by the enforcement of a specification which requires a satisfactory change in the height of the liquid at the indicating device, so that the tolerance on the compartment can be readily enforced.

The ACTING CHAIRMAN. We have Mr. Baucom's motion. The language proposed is about the same as the Committee amendment.

Mr. HOLBROOK. I think the requirement is intended to be identical.

The ACTING CHAIRMAN. We will vote on Mr. Baucom's amendment. There is practically no difference in that from the one presented by the Committee on Tolerances, so far as I can see.

(The amendment was duly adopted.)

The ACTING CHAIRMAN. That will take the place of specification 5. It is now in order to take up Mr. Ragland's amendment.

Mr. HOLBROOK. I take it now that the request is that at a proper place in the specifications there be included the following language: "The minimum dimension of the fill opening shall not be less than 10 inches." That means the diameter, does it not?

Mr. RAGLAND. No, because the fill opening in these streamlined trucks is not a circle, it is a parallelogram.

Digitized by Google

Mr. HOLBROOK. Would you consent to striking out the words "shall not be less than", because that is what "minimum" means. How would you like this language: "The minimum dimension of the fill opening shall be 10 inches."

Mr. RAGLAND. That is satisfactory.

Mr. BAUCOM. Let's analyze that a second. What would the dimensions of an oblong dome be? The intent of Mr. Ragland is that he wants the smallest dimension 10 inches.

Mr. RAGLAND. Mr. Baucom is correct, and when I used the word "minimum" it covered that point.

(The amendment was duly adopted.)

Mr. GRIFFITH. At this moment I would like to ask a question that would be pertinent to the present discussion; it is in regard to the location of the indicator. The present common practice is to have the indicator in the dome head itself. The dome head can be unscrewed; it is interchangeable, usually, with those of other compartments on the tank truck. The indicator for one compartment would not be correct as an indicator for another. We have found that due to some carelessness or because of deliberate change, these indicators are moved. It strikes me that if we should add to our specifications a provision that the indicator, which is usually an iron rod adjustable by a nut screwing on a thread, should be attached to the top of the shell of the tank truck, we would eliminate that difficulty.

Mr. FOSTER. We do not allow the indicator to be attached to the dome head. It must be attached to the compartment itself; and, furthermore, when it is properly set we weld it in place, so that even if the seal wire breaks you always know that you are right. We found that a spot weld on that thread makes it certain the indicator is not going to be punched up and down by the fill pipe that is stuck in there. We never allow a fill point to be attached to the dome head.

Mr. GRIFFITH. That is true, Mr. Foster, but I venture to say that 90 percent of the men have found the condition I have mentioned and have not been able to apply such a remedy. If it were in the specifications there would be no argument with the manufacturers or the users of tank trucks. It might not be practical to make the specification retroactive until after a certain date, at which time we could require them all to comply, just as we do at present with air eliminators on tank trucks.

I believe that such a specification would eliminate any further difficulties we might otherwise have in that connection.

Mr. RAGLAND. You live and learn. I disagree with my good friend, Captain Griffith. If that was tried in my territory I would act under that very promptly.

While I am on my feet I would like to say, sir, that I intended that the amendment offered by me should be nonretroactive.

Mr. BAUCOM. If we may refer back, then, to specification 5, how would it do to add an amendment that indicators shall be permanently attached to the compartment?

Mr. HOLBROOK. Would not the word "shell" be a better one than the word "compartment"?

Mr. BAUCOM. I move that we leave it to the Secretary or the Committee to get the proper phraseology.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Digitized by Google

SECRETARY'S NOTE.—This amendment and the one introduced by Mr. Ragland and adopted immediately prior to this, have been incorporated in specification 5, so that this specification now reads as follows:

5. Fill Openings and Indicators.—*The minimum dimension of the fill opening shall be 10 inches.* An indicator shall be provided within the fill opening of each compartment; *this indicator shall be permanently attached to the shell of the compartment* and shall be located approximately midway between the ends of the compartment. The indicator shall be so designed that it will clearly, distinctly, and unmistakably define the height to which the compartment must be filled in order to contain its marked capacity, *and the surface upon fill of the compartment shall be so reduced in area that the change in height of the liquid surface at the index of the indicator equivalent to the volume representing the tolerance on the compartment capacity shall in no case be less than 0.04 inch.* If this indicator is adjustable it shall be so constructed that it can be sealed in such a manner that its position cannot be changed without destroying or mutilating the seal.

Mr. BOYLE. We have found in some cases that where the compartments of a vehicle tank have been calibrated and the tank has afterward been submitted for a retest, the calibration has changed owing to the displacement of the partitions. We have overcome this by bracing the partitions with rods in the compartments. Is there anything in the specifications which prohibits that condition or that would correct it in the case of new trucks? We have found a change of as much as 3 gallons in adjacent compartments. Sometimes in the pump jobs the pressure developed by the pump will cause the plates to bulge.

Mr. HOLBROOK. Mr. Boyle, there is a requirement that a vehicle tank shall be of sufficiently substantial construction that it may reasonably be expected to withstand ordinary usage without impairment of the accuracy of the deliveries made therefrom. The partitions should be so constructed that they will not be distorted under any conditions of ordinary lading.

8. Diversion from Manifold.

This specification reads as follows:

When two or more compartments discharge through a manifold, effective and automatic means shall be provided to prevent the passage of liquid from the manifold into the discharge line from any compartment.

Amend this specification to read as follows: [7]

Discharge through Manifold.—When two or more compartments discharge through a manifold, effective and automatic means shall be provided to prevent the passage of liquid from the manifold into the discharge line from any compartment. When such discharge lines are equipped with independently operable discharge valves, the construction shall be such that deliveries shall be accurate whether or not more than one of the valves are partially or wholly open.

That is the Committee amendment that has been made in response to a resolution passed at the last Conference, that the Committee give attention to specifications on manifolds of vehicle tanks. The resolution was passed as a result of certain remarks made by Mr. McBride as to difficulties which he had found in Massachusetts.

Mr. RAGLAND. Mr. President, would a check valve in the manifold comply with that requirement? You see the great trouble is, if two of these valves are opened, with one compartment empty and the other full, the man could perpetrate a fraud.

Mr. HOLBROOK. That was already prohibited by the original specification. A check valve to prevent the liquid from flowing back into an empty compartment will not meet the situation. The situation described last year was that when a full compartment delivery was being made and the discharge valve from an empty compartment was open to the manifold, the pump would suck in so much air from

[7] See Secretary's Note following.

Digitized by Google

the empty compartment that the air eliminator could not effectively dispose of it, and the air would pass through the meter and result in a short-measure delivery.

This merely provides that when two compartments can be independently opened, a test may be made delivering from a full compartment with a valve from an empty compartment open, and deliveries shall be within tolerance. The means shall be such that this condition of test shall be met.

(The specification as proposed by the Committee was duly adopted.)

SECRETARY'S NOTE.—Upon review, subsequent to the Conference, it was determined that the amendment adopted in relation to manifolds should not have been incorporated in specification 8 since this specification is limited to apply only to vehicle tanks used as measures, whereas the condition sought to be remedied exists in relation to vehicle tanks equipped with meters.

The amendment made is germane to the material contained in specification 14. Therefore, specification 8 should remain as first written above, and the amending material should be added to specification 14, to make this specification read as follows:

14. Discharge Lines.—If the unit be designed for discharge by gravity, the discharge line shall be as short as practicable and there shall be no shut-off valve at its discharge end. If the unit be designed for discharge by means of a pump, the discharge line shall be of the wet-hose type with a shut-off valve at its discharge end, and immediately adjacent to this discharge valve there shall be installed a spring-loaded check valve so adjusted that drainage of the discharge line will automatically be prevented. When two or more compartments discharge through a manifold and the discharge lines are equipped with independently-operable discharge valves, the construction shall be such that deliveries shall be accurate whether or not more than one of the valves are partially or wholly open.

Mr. HOLBROOK (reading):

SECTION ON LIQUID-MEASURING DEVICES

Specification 52 reads as follows:

Sensitiveness.—Wholesale devices shall be so designed and constructed that they can readily be operated to deliver an amount of 50 gallons within the tolerances on such amount hereinafter provided.

Amend this specification to read as follows:

Sensitiveness.—Wholesale devices shall be so designed and constructed that they can readily be operated to deliver an amount of 50 gallons within the tolerances on such amount hereinafter provided *and whenever any scale or dial is at some point or points or at all points the sole or most sensitive means of determining the amount of liquid discharged, a volume of one gallon shall be represented on such scale or dial by a length of not less than 0.20 inch.*

This is designed to reduce to figures the general requirement that scales or dials shall be such that the tolerance can surely be read. The requirement of 0.20 inch per gallon, provides that there shall be a movement of slightly over 0.04 inch on the dial to correspond to a change in volume equivalent to the minimum tolerance on a wholesale meter.

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK. That concludes the report.

The ACTING CHAIRMAN. Thank you, Mr. Holbrook, for a very interesting report.

THE APPEARANCE IN TRADE OF LIQUID MEASURES OF NON-STANDARD SIZES

By ROLLIN E. MEEK, *Chief, Bureau of Weights and Measures, State of Indiana*

Mr. Chairman, ladies, and gentlemen of the Conference, I attribute my appearance on this program to recent correspondence between

Digitized by Google

officials of the Indiana State Bureau of Weights and Measures and Mr. F. S. Holbrook, Co-Chief, Division of Weights and Measures of the National Bureau of Standards. This correspondence pertained to the appearance in trade in Indiana of the ⅓-quart milk bottle and to a proposed regulation for containers of ice cream or other similar frozen products. I assume our correspondence on the subject of ⅓-quart milk bottles and other nonstandard sizes of liquid measures and containers is typical of the correspondence of this character received by Mr. Holbrook.

It is probable that the officials of the Indiana State Bureau of Weights and Measures are confronted with a situation no different in this respect than is faced by weights and measures officials of other jurisdictions; neither is it likely that we have anything to add to the subject that could be considered entirely new. We do welcome, however, the opportunity of stating the position taken by weights and measures officials of Indiana on the question of nonstandard sizes of liquid measures and refillable containers which are recognized and used as liquid measures. We are unalterably opposed to the use of liquid measures of nonstandard sizes and believe that all weights and measures officials should exercise a united effort to stamp out a growing tendency to use such measures.

I wish to refer you to the Code of Specifications and Tolerances for Liquid Capacity Measures which has been recommended by the National Conference on Weights and Measures to the various States for adoption. Indiana is one of many States which have adopted this code. Specification 2 of this code establishes sizes which are of the customary system and requires that liquid measures shall be of one of the following capacities only: One gallon, a multiple of the gallon, or a binary submultiple of the gallon—that is, a measure obtained by dividing the gallon by the number 2 or a power of the number 2. The tolerances for liquid capacity measures as adopted in this code are for sizes as established in specification 2. Weights and measures officials recognize these tolerances in ascertaining the capacity of liquid measures and the tolerances, furthermore, guide the manufacturers in their construction. This code does not recognize liquid measures of nonstandard sizes, such as ⅛-quart, ⅓-quart, ½-gallon, 3-quart, 5-quart, 6-quart, and other sizes surreptitiously manufactured and used. May I ask the following question to better illustrate my point? What tolerances guide the manufacturer in the construction of these nonstandard sizes and what tolerances are recognized by the weights and measures official in determining their degree of accuracy?

We all realize that liquid measures of the customary system are based on the standard gallon of 231 cubic inches and are of one of the following capacities only: 1 gallon, a multiple of the gallon, or a binary submultiple of the gallon; therefore, it appears that I need not dwell at great length upon the recognized and established sizes. I would rather devote my time to a discussion of the use of nonstandard sizes of measures. I shall endeavor to point out the necessity for a curb to be placed upon the encroachment of spurious liquid measures in the commercial field.

Weights and measures officials should always bear in mind the three essential objectives of specifications and tolerances which serve as a guide for the elimination from use in trade of various devices used

Digitized by Google

for the determination of quantity. They are for the purpose of removing from trade those devices which are faulty, those which are not reasonably permanent in their construction and are likely to become faulty, and those which lend themselves to, or which facilitate the perpetration of fraud. These objectives are truly laudable and may be regarded as cornerstones upon which the entire structure of weights and measures supervision is founded. To disregard the importance of any one of the three would result in a loss in the effectiveness of our work.

We appreciate the importance of the three objectives in the adoption of specifications regulating the manufacture and use in trade of scales, weights, and measuring devices—and I mean by the latter liquid-measuring devices other than standard liquid measures. Let us consider these objectives in relation to the manufacture and use in trade of liquid measures.

The first requisite is that these measures or devices be accurate and this of course is easily determined in instances where close adherence to the standards, as approved and recommended by the National Conference on Weights and Measures, is maintained. Nonstandard sizes do not easily lend themselves to a test to determine accuracy as I have previously illustrated. Inspectors of weights and measures naturally do not have in their possession standards for applying such tests and at the best, any test which might be applied, would be merely superficial. No measuring device should be tolerated, the accuracy of which cannot be readily determined by an inspector in possession of recognized and approved testing equipment.

A measure or container of nonstandard size, in all probability, could be made as permanent in its construction as standard size measures and I shall advance no argument in this connection.

In my opinion the strongest argument which can be advanced against nonstandard sizes is that they lend themselves to or facilitate the perpetration of fraud. Few persons can distinguish at a casual glance, the ⅓-quart, the ⅕-gallon and other confusing nonstandard sizes. Specification 2 of the Code of Specifications for Liquid Capacity Measures provides for a sufficient number of sizes to properly cope with any business transaction involving liquid measures without introduction of irregularities to our recognized code.

As a concrete example of the use of spurious liquid measures, I wish to discuss the ⅓-quart milk bottle which size and necessary tolerance is not mentioned in the Milk Bottle Code. This code, which recognizes the sizes and tolerances as set out in the Code of Specifications for Liquid Capacity Measures has been adopted in Indiana. Milk bottles were strictly standardized to the end that when one of the most important and universal articles of food was sold, it should be properly sold, and because they were to be used as measures over and over again, of foods of special importance.

One of the reasons advanced to justify the use of ⅓-quart milk bottles is that they enable the milk dealer to meet competition afforded by bottlers of soft drinks. Soft drinks and beverages are ordinarily bottled and regulated only as package goods, and any size of container may be used if properly marked with the contents; therefore these drinks are usually bottled in sizes which can be sold at a "magic" price, either 5 or 10 cents. It is the contention of milk dealers that present prices of milk do not justify its sale in standard-size bottles

Digitized by Google

when it is being sold for immediate drinking in factories, restaurants, and schools. They contend their customers do not care for a full pint of milk for quick consumption for two reasons: First, it is more milk than they care to drink at one time, and, second, they object to the odd penny sale which is often necessitated and which they profess is bothersome.

In conferences with milk dealers I have listened, as has probably every other State weights and measures official, to all the reasons advanced to justify the use of measures of nonstandard sizes and I still remain unconvinced of their practicability, insofar as customer protection is concerned. While each suggestion contains some merit, the all important question which is to be decided by weights and measures officials is—Is it to the advantage of the public that we insist on maintaining our standards? If our standards are broken down in one place what is to prevent their breaking down in another and probably less-suspected place.

If a ⅓-quart size milk bottle and other nonstandard measures are provided as convenient containers the contents of which could be charged for at one or the other "magic" price of 5 or 10 cents, consistency might demand another size when the price of the commodity changed. This condition could be carried so far as to keep weights and measures officials busy changing their standards to meet current changes in prices of commodities.

An odd-size container, one which could not be properly classified as a measure, but one the use of which bore a close relationship to the use of nonstandard measures, made its appearance in Indiana a few years ago. This was a ⅛-gallon ice-cream container introduced by some ice-cream manufacturers. The reason assigned for the introduction of this container was that because of its smaller size and shape it more readily fitted the freezing compartments of household refrigerators. In conducting an investigation of the use of the ⅛-gallon container it was found, by making numerous purchases of ice cream, that the retail dealer often represented and sold the ⅛-gallon container as a quart. I have used the above illustration to show the ridiculousness of some of the suggestions advanced in order to circumvent the standards. It is needless to say immediate steps were taken to break up this practice by calling to the attention of the ice-cream manufacturers the existence of a code of specifications regulating the size of ice-cream containers.

The 5- and 6-quart oil measures represent another perennial endeavor to introduce new sizes of liquid measures. To my knowledge measures of these sizes are not being used in Indiana, but I do understand they have made their appearance in some other jurisdictions. It is quite probable in the not distant future, efforts may be made to legalize containers of these sizes, but we should be hesitant in taking any such action as it would be another deviation from our accepted standards.

We should not lose sight of these truths—*our standards must be kept inviolate and must not be changed or evaded at the whims of a few individuals—commodity prices must be based on our accepted standards and not our standards based on commodity prices—standards may be perpetually maintained but commodity prices due to many reasons are continually changing.*

The tendency to depart from the standard units, which is done at the expense of customer protection, is one of the most dangerous

Digitized by Google

trends facing the weights and measures official. There is an old axiom with which we are all familiar, "a chain is no stronger than its weakest link", and this truth may well be applied to weights and measures administration. While the subject of my paper precludes the discussion, at great length, of problems of weights and measures inspectors other than those connected with liquid measures, I do wish to impress you with its close relationship to practically every function of weights and measures supervision. Such odd-size weights as the ⅓- and ⅔-pound weights and the manufacture of scales and liquid measuring devices graduated in units other than those recognized in existing codes tend toward the breaking down of existing standards.

We, in Indiana, are unalterably opposed to the use of liquid measures of nonstandard sizes and wish to commend the officials of the National Bureau of Standards and the National Conference on Weights and Measures for the stand taken by them in support of our existing standards. Every weights and measures official should lend his untiring support to a program designed to maintain and improve our standards. This course will, in no respect, work a hardship on equipment manufacturers but it will be responsible for greater consumer protection, the objective or goal of weights and measures officials.

At this time I want to express my appreciation to the chair for the honor conferred upon Indiana in having the invitation extended to us to appear on your program.

Mr. WILHELM. How soon will we get the report of this Conference?

Mr. HOLBROOK. Almost certainly not before January 1.

Mr. WILHELM. That seems like a long time.

Mr. HOLBROOK. I may say that it is gotten out of the National Bureau of Standards at the earliest possible moment. We cannot predict how long the Government Printing Office will take to produce it, and we do the best we can under those circumstances.

CITATION BY OFFICIALS OF IMPORTANT COURT DECISIONS IN THEIR JURISDICTIONS

Mr. ROLLIN MEEK. I brought to this Conference a report of a recent prosecution in Richmond, Ind., which I think is most outstanding. If the Conference would care to hear it, I would like to read it, otherwise I would be glad to pass it up.

The ACTING CHAIRMAN. Suppose you present it to the secretary and it will be embodied in the report.

SECRETARY'S NOTE.—A statement of the facts in the case is as follows:

The perpetration of an unusual method employed for the purpose of defrauding the public was discovered near Richmond, Ind., recently by local officials. A charge of obtaining money under false pretense was lodged against the two defendants, who pleaded guilty and were sentenced from 1 to 7 years in the State prison.

The defendants were caught operating a tractor-truck equipped with two hydraulic jacks; the one located in front of the fifth wheel was used in buying, and the one located back of the fifth wheel was used in selling. On using the front jack, a considerable amount of the weight of the trailer was transferred to the tractor. On selling, the back jack was used, throwing a proportionate amount of the weight of the tractor upon the scale. A heavy log chain weighing approximately 150 to 200 pounds was wrapped around the entire length of the front bumper to gain weight and to add leverage to the tractor. Two gages were located in the glove compartment on the dash, one a 10,000-pound and the other a 25,000-pound hydraulic.

Two men were always with the truck and on weighing one man would remain in the cab, keep the motor running and operate the jacks. The gages in full

Digitized by Google

view would readily show the operator of the jacks how much they were gaining on each load. On questioning, the men admitted that they would sometimes set the brakes on the trailer and let the clutch slide against the load which would increase the weight on the load platform. At the time of arrest the prevailing price of shelled corn was $1.37 per bushel and the men admitted, with the aid of the jacks, that they were able to obtain a fraudulent profit of between $50 and $60 per load.

The entire hydraulic-jack system was hidden from view, being enclosed in a sheet-metal case. A piece of canvas was placed across the front end and extended around to the sides, which was approximately 18 inches wide and of triple thickness. The jack equipment could not be seen unless one was really looking for it.

The jack equipment was confiscated by Carl J. Kutter, City Inspector of Richmond, who assisted in the investigation.

REPORT OF COMMITTEE ON NOMINATIONS, PRESENTED BY JOHN P. McBRIDE, CHAIRMAN, AND ELECTION OF OFFICERS

Your Nominating Committee respectfully submits the following names for the designated offices:

For President, Lyman J. Briggs; Vice Presidents, Rollin E. Meek, W. S. Bussey, C. J. P. Cullen, John J. Levitt; Secretary, F. S. Holbrook; Treasurer, George F. Austin, Jr.

For members of the Executive Committee, C. E. Tucker, William C. Witfoth, K. K. Solberg, Howard E. Crawford, H. N. Davis, C. L. Klocker, S. T. Griffith, James O'Keefe, B. W. Ragland, George M. Roberts, Louis G. Waldman, George Warner, S. H. Wilson, James Boyle, James Sweeney, Charles C. Read, and Charles H. Bulson.

(Signed) JOHN P. McBRIDE, Massachusetts, *Chairman*,
CHARLES H. BULSON, Jefferson Co., New York,
C. B. TOLAN, Fort Wayne, Indiana,
B. W. RAGLAND, Richmond, Va.,
H. N. DAVIS, Vermont,
C. E. TUCKER, California,
Committee on Nominations.

(It was moved and seconded that the report be adopted, the question was taken, and the motion was agreed to. Accordingly, the gentlemen nominated by the Committee on Nominations were duly elected to the respective offices.)

The CHAIRMAN. At this time the Resolutions Committee will make its report. I would appreciate it if Vice President Levitt would come to the platform and take the chair.

(At this point Mr. Levitt, Vice President of the Conference, assumed the Chair.)

REPORT OF COMMITTEE ON RESOLUTIONS, PRESENTED BY JOHN J. LEVITT, AND ADOPTION OF RESOLUTIONS

APPRECIATION TO DIRECTOR AND STAFF OF THE NATIONAL BUREAU OF STANDARDS

Whereas Dr. Lyman J. Briggs, F. S. Holbrook, R. W. Smith, and their able and efficient staff have extended valuable assistance and guidance to this Conference, of which the Conference is highly appreciative: Therefore be it

Resolved, That this, the Twenty-seventh National Conference on Weights and Measures, does hereby record its grateful appreciation to the above-named gentlemen.

APPRECIATION TO MANAGEMENT OF HEADQUARTERS HOTEL

Whereas the Management of the Hotel Raleigh has done everything within its power to make our present meeting the success which it has been: Therefore be it

Resolved, That this, the Twenty-seventh National Conference on Weights and Measures, assembled at the Hotel Raleigh in Washington, D. C., this 4th day of June 1937, does express its warmest appreciation and thanks to the management of the said hotel for the careful provisions made for our meeting; and be it further

Digitized by Google

Resolved, That the Secretary of the Conference be instructed to transmit a copy of this resolution to the management of the Hotel Raleigh.

IN MEMORY OF DECEASED MEMBERS

Whereas during the past year we have lost through the plan of Divine Providence several members of this Conference; and

Whereas our association with these departed brothers has been an inspiration to us to continue with greater determination toward the ideals set by them: Therefore be it

Resolved, That we of the Twenty-seventh National Conference on Weights and Measures, hereby record this expression of sincere sorrow at the loss of these brothers.

APPRECIATION TO THE PRESS AND TO THE SCALE JOURNAL

Whereas the press of the city of Washington has been generous in reporting the activities of our present meeting; and

Whereas the Scale Journal has been likewise generous in giving advance notices of our present meeting: Therefore be it

Resolved, That this, the Twenty-seventh National Conference on Weights and Measures, does hereby record its grateful appreciation to the press of Washington and to the Scale Journal.

ENDORSEMENT OF PROPOSED BILL TO FIX THE STANDARDS OF WEIGHTS AND MEASURES OF THE UNITED STATES

Whereas our President, Dr. Lyman J. Briggs, has formally called to our attention a proposed bill to fix the standards of weight and measure of the United States, and

Whereas this Conference is of the opinion that the proposed bill should be adopted and passed by the Congress: Therefore be it

Resolved, That this, the Twenty-seventh National Conference on Weights and Measures, does hereby fully endorse the proposed bill as reported to the Conference by Dr. Briggs, and does urge its passage; and be it further

Resolved, That copies of this resolution be transmitted by our Secretary to the appropriate committees of Congress.

APPRECIATION TO OFFICIALS COOPERATING

Whereas the Governors and the county and city officials of the various States, through their manifest interest in weights and measures work, have made it possible for their respective jurisdictions to be represented at this, the Twenty-seventh National Conference on Weights and Measures, and

Whereas such cooperation and attendance have in a most practical way furthered uniformity in regulations for the various jurisdictions and have otherwise assisted the general good of the work: Therefore be it

Resolved, That this, the Twenty-seventh National Conference on Weights and Measures, does appreciate such practical cooperation and does make this resolution a part of the record of its meeting.

ENDORSEMENT OF PROPOSED FEDERAL LEGISLATION FOR STANDARDIZATION OF PACKAGES FOR CANNED FOODSTUFFS (H. R. 6964)

Whereas our attention has been formally called to certain needed legislation with reference to the standardization of packages for canned foodstuffs, and

Whereas Hon. Harry Sauthoff, Member of Congress from Wisconsin, has introduced in the Congress a bill, known as H. R. 6964, which is intended to accomplish the necessary control of this matter in a manner consistent with the beliefs of this Conference: Therefore be it

Resolved, That this, the Twenty-seventh National Conference on Weights and Measures does hereby record its hearty endorsement of the bill known as H. R. 6964; and be it further

Resolved, That a copy of this resolution be transmitted by our Secretary to both the Committee on Coinage, Weights, and Measures and the Hon. Harry Sauthoff.

Digitized by Google

ENDORSEMENT OF PRINCIPLE OF GENERAL STANDARDIZATION OF PACKAGED GOODS

Whereas we have knowledge of the benefit which would accrue from a standardization of all packaged goods: Therefore be it

Resolved, That this, the Twenty-seventh National Conference on Weights and Measures, does hereby record its sincere belief that a general standardization of packaged goods is greatly to be desired, and does direct its Executive Committee to consider ways and means of accomplishing this and, at the same time, of eliminating the so-called slack-filled package.

REGULATION OF USED COMMERCIAL WEIGHING DEVICES, AND LICENSING OF SCALE REPAIRMEN

Whereas there have come to the attention of this Conference certain abuses in the resale and reinstallation of used commercial weighing devices, and

Whereas consideration of the available facts indicates clearly the necessity for closer supervision over such equipment and its resale and reinstallation: Therefore be it

Resolved, That it is the sense of this, the Twenty-seventh National Conference on Weights and Measures, that the sale, resale, and reinstallation of all used commercial weighing devices should be subject to strict regulation by the weights and measures official having jurisdiction at the proposed place of use; and be it further

Resolved, That, as a further means of accomplishing this end, all scale repairmen should be subjected to a qualifying examination and should be registered and licensed.

MODIFICATION OF SPECIFICATIONS FOR SMALL-CAPACITY SPRING SCALES

Whereas the small-capacity spring scale commonly used by hucksters, peddlers, produce merchants, and grocers, has been and is being cheapened by the manufacturers of this class of equipment to such an extent that the accuracy of this type of scale is being seriously impaired and its useful life so shortened as to offer more opportunities for fraud and be detrimental to the public good: Therefore be it

Resolved, That the Committee on Specifications and Tolerances of this, the Twenty-seventh National Conference on Weights and Measures, be hereby instructed to review the Conference specifications covering the above type of equipment and to report at the Twenty-eighth Conference its recommendations for any modifications in those specifications which will tend to improve the present condition.

(Signed) C. J. P. CULLEN, Pennsylvania, *Chairman*,
L. J. ALLEN, Washington,
C. D. BAUCOM, North Carolina,
WILLIAM H. ISING, Kentucky,
JOHN J. LEVITT, Illinois,
CHARLES C. READ, New Jersey,
ARTHUR J. WILHELM, Michigan,
Committee on Resolutions.

(As each of the above resolutions was read, it was duly adopted, the third by a rising vote; an amendment was adopted in the case of the fifth resolution providing that it be referred to the appropriate committees of Congress and this material has been incorporated in the text given above.)

The ACTING CHAIRMAN. Gentlemen, on behalf of the Resolutions Committee I want to express our appreciation for the assistance given by the different members of the Conference in aiding us to draw up these resolutions. We also thank you for your cooperation in accepting the resolutions as presented.

RESOLUTION IN RELATION TO LABELING ELECTRIC-LIGHT BULBS

The ACTING CHAIRMAN. I also have a resolution which has been handed to the chair. I will read the resolution which was presented from the floor.

Digitized by Google

Whereas the purpose of weights and measures activities is to protect purchasers and/or consumers; and

Whereas the electric-light bulb or lamp is a device designed for the purpose of emanating light rather than for the consumption of energy; and

Whereas the value of light so emanated does not appear on the principal label, stamp, or marking of the electric-light bulb or lamp as now being offered for sale, sold, or distributed: Therefore be it

Resolved, That the Twenty-seventh National Conference on Weights and Measures go on record declaring that in order to protect the consumers of electric light a condition exists necessitating labeling, branding, or stamping on each and every electric-light bulb or lamp the illuminating value in terms of lumens or candlepower in total or per unit of energy consumed, and request that the United States Department of Commerce, through the National Bureau of Standards and/or other Government agencies, set in motion such machinery as necessary to effect the labeling as herein defined; and be it further

Resolved, That a copy of this resolution be sent to the United States Department of Commerce.

The ACTING CHAIRMAN. Are there any comments on this resolution?

Mr. HOLBROOK. I move that that be laid on the table. It seems to me that such a resolution as that should have come regularly through the Resolutions Committee so that it would have had prior consideration.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. CULLEN. Gentlemen, I wish to refer to the resolution just presented and to offer an explanation so there won't be any misunderstanding.

At the meeting last evening Mr. Baucom mentioned and proposed this resolution. While it was not drawn up, the outline of it was discussed. This morning he came to me and to another member and we told him to draw the resolution up and present it, stating that he could discuss it from the floor. The Resolutions Committee was aware that this resolution was being presented, but we did not see the contents of it. There was nothing underhanded done and I want you to know that.

The ACTING CHAIRMAN. Mr. Cullen, the resolution has been voted upon. I am sorry I did not know the circumstances connected with it at the time, but it strikes me that electric-light bulbs are not a weights and measures proposition. I do not know whether the National Bureau of Standards considers it so or not, or whether they have some other division which takes care of that. Mr. Holbrook could probably give us a little enlightenment on that subject.

Mr. HOLBROOK. The reason I made the motion to lay upon the table was that I considered that the time was insufficient to develop the desirability of the resolution and it did not seem that this Conference should pass such a resolution as that without extremely careful consideration. I think that if at some future Conference such a resolution is brought before the body when it can be thoroughly discussed, the Conference can at that time act upon it intelligently. The reasons for it would have to be very carefully developed, and the time now is insufficient to do that. I know absolutely nothing about the desirability of the resolution and I judge that most of the delegates here are in my situation. Perhaps Dr. Briggs would like to tell us something about the subject.

Dr. BRIGGS. Candlepower alone does not tell us anything about the efficiency of a lamp. Neither does the wattage. The ratio of these

Digitized by Google

two quantities is a measure of the efficiency. Lamps can easily be made that will have a specified candlepower and a long life and yet be very inefficient.

The Government purchases several million incandescent lamps annually. The contract specifies that the light output shall not be less than a certain number of lumens per watt. Tests made by the National Bureau of Standards in connection with these contracts show that the manufacturers are steadily increasing the efficiency of their lamps. There are many technical aspects to this subject, but if the Resolutions Committee feels that it comes within the scope of activities of the National Conference, the Bureau will give such technical assistance as may be desired.

A standard high-grade 50-watt lamp costs 15 cents and has an average life of 1,000 hours. Assuming electric power to cost 5 cents per kilowatt hour, the power bill for 1,000 hours would be $2.50. The power bill is so much greater than the original cost of the lamp that it is most unwise to buy cheap, inefficient lamps, which use just as much power but give out less light.

Mr. BAUCOM. I would like to rise to a point of personal privilege. There seems to be an idea that I have slipped something over. It so happens that one member of the Committee last night was not present when these resolutions were drawn. I couldn't help that. We discussed this somewhat and the members spoke well of it and I was instructed to proceed to draw up the resolution as presented and have it ready by this morning. Well, you know the conditions that have existed, with everybody busy, and I read it over to Mr. Cullen and one or two others and it seemed to meet with their approval, and it was agreeable to them that it be submitted. It so happens that it did not get in with the resolutions that came up from the Committee.

Now, getting back to the point, I feel that when you buy electric-light bulbs you don't buy watts or voltage—you buy illumination. If a lamp does not give illumination in accordance with a standard that you have set up in your mind as being proper for a 100-watt lamp, you are being short-measured in light. You may think that a little far fetched, but if you follow through you will recognize that you are buying light, even though you are paying for wattage.

We also recognize that at the present time this country is being flooded with lamps made in a foreign country that are underselling our lamps. They do not give the illumination our lamps give, but they sell for 10 cents whereas our lamps cost 15 cents. We have no way of knowing how much light we are going to get for 100 watts on our meter, and the purpose of this resolution was to set in motion some investigation by the Bureau or the Department of Commerce, which would disclose the true value of the illumination you should get when you buy a 100-watt lamp. We know that some lamps marked 100 watts will probably consume 120, and their illuminating power is way below standard, yet we go right along and buy them every day. They burn out, and we are just victims of the situation.

The major illuminating engineers of the country are strongly in favor of something being done which will absolutely classify these lamps according to their true value. That was the purpose of the resolution. The intent was good, there was absolutely nothing done under cover, and I believe that in the course of time you will come to

Digitized by Google

realize and agree that we are not buying wattage when we buy lamps, but that we are buying illumination.

Mr. HOLBROOK. I don't think my motion to lay the resolution on the table can be construed as a criticism of anyone. I had no idea where the resolution came from. However the resolution seems to have produced the desired effect through the offer of Dr. Briggs to have the National Bureau of Standards cooperate with the Conference in further developing this subject at a future meeting.

Mr. GRIFFITH. I am quite sure the entire Conference is fully aware of the fact that the resolution was presented in good faith by Mr. Baucom. Nobody had any idea of any ulterior motives.

The ACTING CHAIRMAN. I want you to know that I did not know that you had presented the resolution. There is nothing personal about this. The resolution was just handed to me; I am sorry I didn't know about it. I hope it is cleared up to your satisfaction.

REPORT OF THE TREASURER, GEORGE F. AUSTIN, JR.

Receipts:		
Balance on hand June 1, 1936		$332.19
June 11, 1936, dues, 1936 Conference		194.00
Accrued interest		7.54
Total receipts		533.73
Disbursements:		
July 18, 1936. Stenographic services, 1936 Conference	$10.00	
July 24, 1936. Messenger services, 1936 Conference	10.00	
July 26, 1936. Stenographic services, Resolutions Committee, 1936 Conference	3.40	
Total disbursements		23.40
Balance on hand June 1, 1937		510.33

(Signed) GEO. F. AUSTIN, JR., *Treasurer.*

(The report was duly accepted.)

Mr. MCBRIDE. I make a motion to authorize payment of the customary expenditures incident to the conduct of this Conference, and also the special expenditure made this year by reason of the trip to Annapolis.

(The motion was seconded, the question was taken, and the motion was agreed to.)

DATES FOR AND CONDUCT OF CONFERENCE

Mr. SWEENEY. I desire at this time to offer a suggestion that some consideration be given to an earlier meeting. I think we have all suffered a great deal from the heat during the past week, and I think it would be very nice if arrangements could be made to have the meeting a month earlier, so as to get the benefit of a little cooler weather and to have, during our stay here, a little more energy than we have possessed during the past week. I offer that as a suggestion and I hope it will be considered.

While I am on my feet, I would like to offer another suggestion, and that is that the valuable part of this Conference is the discussion on specifications and tolerances, and I would suggest that arrangements be made in the future that those items be taken up in the

Digitized by Google

early part of the Conference and not on the last day, because of the fact that everyone seems desirous of getting away and full time is not given to the consideration of the various items.

Mr. HOLBROOK. In relation to those two items, I may say that the date of the Conference is upon the heads of those who attended the last Conference. After the last Conference we sent a questionnaire to each official delegate asking him to suggest a time of meeting, and the majority of delegates voted for the first week in June.

Now, in relation to the second question, it has several times been suggested that the delegates did not have enough opportunity to study the report of the Committee on Specifications and Tolerances before it was presented to the Conference. The Committee on Specifications and Tolerances is enabled to meet only once a year, in the 4 days immediately preceding the Conference, and it then issues its report in mimeographed form. This year the report was available on Wednesday morning. Now the expressed desire of the delegates formerly has been that they have that report in their hands as long as possible to give them an opportunity to familiarize themselves with the amendments which will come up. Therefore, it seemed logical, in order to give the delegates sufficient time, that the report of the Committee be given on the morning of the last day.

I may say, with regard to the desire of the delegates to get home, that this is distinctly a 4-day Conference and the last day is, in our consideration, just as important as the first, second, and third days. We think that the delegates should stay over for the last session or cut the Conference down to a shorter period of time.

The ACTING CHAIRMAN. Mr. Sweeney, you offered that as a suggestion. I am sure that the Executive Committee and the others in charge will consider your suggestions for what they are worth.

SECRETARY'S NOTE.—In connection with the above discussion it may be mentioned that in the programmed item "Report of the Secretary of the Conference", which was withdrawn on account of shortage of time, the following was to have been included:

Shortly after the meeting of the Twenty-Sixth National Conference on Weights and Measures held in June 1936 a questionnaire was sent out to the weights and measures officials in attendance, designed to elicit information which would be helpful in the arrangement and conduct of future meetings. Seventy-three officials filled out and returned their sheets. For the information of the delegates the results are presented below:

69 officials favored annual meetings, while 4 expressed a desire for biennial meetings.

60 believed the meeting should be scheduled for 4 days, while 13 favored a 3-day session.

60 were in favor of the setting aside of ½ day for a tour of Bureau laboratories, while 12 voted against this.

65 favored the retention of the customary reports of State delegates and representatives of State associations, one or two qualifying their replies; 8 were in favor of dropping this program item.

63 favored the retention of the program item, "Demonstration of Recent Developments in Weighing and Measuring Apparatus by Representatives of Manufacturers" and the exhibit held in connection therewith; 5 were opposed to this item.

70 voted in favor of the continuation of the program item, "General Consideration of Subjects of Interest and Questions Brought up for Discussion by Officials"; only 2 would dispense with this.

As to the time recommended to be assigned to this item there was a considerable divergence of opinion. 16 suggested periods of from 1 to 2 hours; 7, 2 to 3 hours; 21, ½ day; 1, 1 day; 7 believed that as much time as was needed should be devoted to it. Scattered votes suggested "¼ session", "¼ time", "¼ hour for each State delegate", and "10 minutes for each delegate."

Digitized by Google

On the question of the preferred week for the Conference sessions the vote was as follows:

1st week in June	42
(2 votes coupled with this, the 2d week in June.)	
One of the last 2 weeks in May	16
2d week in June	6

One or two votes each were received for the following: "April or early May", "after June 1st", "Fall or winter", and "3d week in June."

PAPER CONTAINERS FOR MILK

Mr. KRENGEL. Within the last year or two a new container made its appearance on the market—a paper container for milk. In communicating with various State officials we find that different attitudes are taken by different officials with regard to the container. There are a number of them made by a number of firms. The container is used only once—as a wrapper around a certain predetermined quantity of milk which is measured by machine. I would like to leave the thought with you that it should be decided whether a container of that type should comply with the specifications established for the glass bottle or whether it should be regarded as a wrapper for milk.

Mr. HOLBROOK. The specifications and tolerances of the Conference in relation to milk bottles regulate only such packages as are used as measures in the sale of milk.

Now the ordinary glass bottle is a measure, because the capacity of the bottle itself determines the amount of milk which will be put into the bottle. In other words, the quantity of milk is not premeasured in any way; the milk is put into the bottle, the filling machine cuts off the milk at a certain predetermined point, and delivery is made accordingly. Some of the paper containers are used as measures in that way. The container itself is the only measure which is used in determining the amount of milk, and those containers are regulated by the Conference code.

There is another type of container which is entirely different. It is used in connection with a machine which predetermines the amount of milk, and that predetermined amount of milk is poured into the container. In the opinion of the Committee on Specifications and Tolerances that character of container is not used as a measure and is not regulated by our present code. In other words, a predetermined quart of milk is put into one of these containers, the package is labeled and sold as a quart, and the Committee on Specifications and Tolerances believes that that is a package and that it should be regulated as all other package goods are regulated.

Mr. GRIFFITH. Mr. Chairman, perhaps I can throw some light on the subject, having just recently had experience with the paper package mentioned particularly by the gentleman who spoke from the floor, which is a package only, the amount of milk being predetermined. But in drawing up regulations for paper milk containers or bottles you have to give consideration to all classes in order to meet the situation involved. As Mr. Holbrook mentioned, some paper containers are measures themselves and they of course must comply strictly with the code now in force on glass bottles. The introduction into our market in Maryland recently of the paper package the gentleman spoke of, however, involves a commodity which is so commonly used and is so vital that our city administration desired, since there were no regula-

Digitized by Google

tions, as I told them, that we should draw such regulations as nearly as possible approximating the present regulations on the milk bottle. That being so, we drew up a set of regulations and I think they are reasonable, because a great deal of latitude has been given. A copy of them will be furnished anyone desiring them if they will request it of me. The Conference Committee on Specifications and Tolerances has a copy and it suggested some of the items we had included in it.

The ACTING CHAIRMAN. I think your question will be considered by the Committee on Specifications and Tolerances.

Mr. ALLEN. Speaking on that point, the secretary mentioned that those machines that gave a predetermined quantity placed packages outside of the category of measures. The question arose in my mind as to how we are going to determine whether the bottles are filled by one machine or another when there is a large number of dairies using the container. Recently I had this matter called to my attention, and I made a number of tests. There was even a greater variation in the capacity of these paper bottles than there was in the capacity of the glass bottles.

I immediately wrote to the manufacturers' representatives, notifying them they would have to comply with the specifications for milk bottles. It seems to me that even though these are used but once they are a container for a quart of milk, and they come under the classification of measures. Certainly if a person today gets a glass bottle presumed to be a quart or a pint and tomorrow gets a paper bottle presumed to be a quart or a pint, they should contain the same quantity of milk.

The ACTING CHAIRMAN. Is there any further discussion? Are there any further items of business?

(A motion was made and seconded that the Conference adjourn, the question was taken, and the motion was agreed to.)

(Thereupon, at 1:20 p.m., the Twenty-seventh National Conference on Weights and Measures adjourned sine die.)

Digitized by Google

APPENDIX

DATA ON THE VEHICLE-SCALE TESTING UNIT OF THE NATIONAL BUREAU OF STANDARDS, AND ON RECORDS AND REPORTS PREPARED IN CONNECTION THEREWITH

There is here presented some of the material distributed at the Conference in connection with the paper on "Results of Tests of Vehicle Scales made with National Bureau of Standards Equipment in Program of Cooperation with States", which paper appears on pages 46 to 53 of this report.

Dimensional and other data on the vehicle-scale testing unit are as follows:

Number of axles	3
Number of tires	10
Size of tires	9.75×20
Normal wheel base	202½ in.
Wheelbase of two rear axles	45 in.
Wheelbase, front to rear axles	225 in.
Gross weight (approx.)	40,000 lb.
Front-axle load (approx.)	8,500 lb.
Rear-axle load (approx.)	15,500 lb.
Load per inch of tire width (approx.)	400 lb.
Over-all height	129 in. (10 ft 9 in.)
Over-all body width	97 in. (8 ft 1 in.)
Over-all body length (bumper to bumper)	290 in. (24 ft 2 in.)
Over-all length (front bumper to end of boom)	350 in. (29 ft 2 in.)

The unit comprises a motortruck upon which is mounted a power-operated, horizontal-boom crane. The primary load consists of fifteen 1,000-lb test weights; small weights, a two-wheel weight-handling cart, tools, and testing accessories are also carried. The regular crew consists of two men.

The truck carries red flags and three kerosene flares, and is equipped with road lights and clearance lights and reflectors as specified in the recommendations of the National Highway Users Conference.

The unit travels under license plates "National Bureau of Standards, Department of Commerce, U. S.—1."

The inserts which follow are typical test and inspection records prepared in the field, and typical reports on accurate and inaccurate vehicle scales as issued by the National Bureau of Standards to scale owners and to the weights and measures officials in whose jurisdictions the scales are located. The test and inspection sheets are facsimile reproductions of the official records on one of the routine tests made by the testing unit, except that blank forms have been substituted for those portions of the sheets on which are entered data which would serve to identify the particular scale in question. The two reports are copies of reports issued in normal course, the inaccurate scale being the one for which the field data are shown on the test and inspection records. The "Supplement" appearing on the reverse of the report forms outlines test procedure, tolerances, SR requirements, and other information in connection with vehicle scales; this supplement is the one in current use and embodies the changes agreed upon by the Twenty-seventh National Conference on Weights and Measures. It may also be noted that the face of each report form as here presented, differs slightly from the form originally used, and that some changes have recently been made in the inspection report, as compared with the form here presented, in order to provide for the ready entry of a few additional items of information.

Digitized by Google

Digitized by Google

Form 250

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

Sheet No. .....
Test begun .....
Test ended .....

, 19....

VEHICLE-SCALE TEST RECORD

Observer.....

Place ..... Address .....

Owner ..... Scale designation .....

Original report to ..... (Name) (Street address) (Post office)

Copy of report to ..... (Name) (Street address) (Post office)

Weather conditions .....

LOAD				INDICATIONS			ERROR	SR	REMARKS
Character W-T-S	Position L-R-N-F T-D	Test weights	Balancing weights	Weighbeam	Reading face	Counterpoise weights			
		Initial	Balance	-16*					
		0	50	0					Balanced
		0	67	0				17	
W	R	4000	96	4000			-46 ✓		
W	R	4000	98	F990 3000					F-12 ✓
W	R	8000	100	8000			-50 ✓		
W	R	8000	97	F990 7000					F-7 ✓
W	R	15000	89	15000			-39 ✓		
W	L^8R^7	15000	79	15000			-29 ✓		
W	L^8R^7	15000	96	15000				17 ✓	
W	L	15000	82	15000			-32 ✓		
W	L	8000	78	8000			-28 ✓		
W	L	4000	85	4000			-35 ✓		
		0	87	0					B.C.-37 ✓
T	R	0	55	23140					Gas 5*
T	L	0	50	23190					
WT	L	8000	50	31040			-150 ✓	-149	
WT	L	15000	50	37900			-290 ✓	-285	
WT	L	15000	65	37900				15 ✓	
WT	R	15000	60	38120			-25 ✓	-23	Gas 2*

W=Test weights; T=Carrying truck; S=Other strain load; L=Left; R=Right; N=Near; F=Far; D=Distributed.

O 94 O

BC -7 ✓

119

Digitized by Google

Digitized by Google

NS 199

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

C 794 (Inspector)

VEHICLE - SCALE INSPECTION RECORD

(Owner's representative)

(W. & M. official present)

SCALE DATA

(Position)

General

Make ____ Type MT ____ Shop No. —

Installed. Date Prior 1927 By — Material weighed Misc. (Master Scale)

Loads weighed | Character of vehicles Trucks + Wagons Range of tare weights 1000 - 12000 Range of gross weights 2000 - 30000

Regularly tested by City Last test. Date Oct 1936 Result O.K.

Last repairs. Date None By — Kind —

Lever system

Straight or Torsion Levers ____

A or RR Pattern ____

Rigid or Suspension Bearings ____

Wire Extensions ____

Pivot Protection Grease

Accessibility Good

Indicating elements

Recording or Nonrecording Weighbeam ____

Gipse or Unit Wts. ____

Main Bar 40000 x 1000 - 990 x 10

Tare Bar ____

Reading Part ____

Enclosed in Scale house

Pit

Character Concrete

Drainage Sewer

Entrance Pit neck

Lever Foundations Concrete

Platform

Size 20' x 9'

Material Plank

Weatherguards None

Approaches Sharp incline, curve, both ends

Adjustments this date None

Modifications this date ____

INSPECTION REPORT

Fractional poise rack bar is broken near center of bar, and is loosely held together by the screws which hold it to the fractional poise. Part of a tooth of the rack bar is broken out at the break, and the poise sticks and binds when moved past 500 on the indicator. Weighbeam notches are dirty. Platform planks are slightly rotted. Scale pit and scale parts, pivots and bearings dirty. Structural steel rusting. Bearing suspension assemblies at near left and far right corners are badly out of plumb, and suspension bolt in both of these assemblies is not seated in proper position on the rocker block, causing a bind both of these assemblies.

Recommend overhaul of main and fractional poises, replacing the broken rack bar with a new one. Recommend weighbeam notches be kept clean, all scale parts and pit be cleaned; lever system should be repainted, and pivots and bearings repacked with grease; recommend that out of plumb conditions of bearing assemblies be corrected, and suspension bolts correctly seated on their rocker blocks.

See report #136

U. S. GOVERNMENT PRINTING OFFICE (8043)

Digitized by Google

Digitized by Google

Form 353

RWS:HER
II-7/Tw 78954

U. S. DEPARTMENT OF COMMERCE

National Bureau of Standards

REPORT OF VEHICLE SCALE TEST

Scale owner: Date of test:

Scale location: Test number:

Scale description: 40,000-pound Motor-Truck Scale

The scale was tested with standard weights in an amount of 15,000 pounds in combination with a strain load of approximately 23,000 pounds.

The scale was found to be sufficiently sensitive, the maximum SR being 17 pounds. (The maximum allowable value for the SR of this scale is 20 pounds.)

The scale was found to be inaccurate; its weighing performance is indicated by the results reported below, selected from the complete test data.

TEST RESULTS

ELEMENT UNDER TEST	TEST LOAD		STRAIN LOAD	ERROR	
	Position	Pounds	Pounds (Approximate)	Pounds	Percent
Weighbeam	Right end	4000		-46	-1.15
"	"	8000		-50	-0.62
"	"	15000		-39	-0.26
"	Left end	4000		-35	-0.88
"	"	8000		-28	-0.35
"	"	15000		-32	-0.21
"	Distributed	15000		-29	
"	Left end	8000	23000	-149	-1.86
"	"	15000	23000	-288	-1.92
"	Right end	15000	23000	-23	

The fractional weighbeam bar was separately checked and its indications were found to be in error by approximately 10 pounds per thousand, the weighing error being in the minus direction.

At the conclusion of the first portion of the test reported above, before the application of the strain load, the scale was found to have shifted its zero balance by about -37 pounds. At the end of the test there was noted a further balance shift of -7 pounds.

As found, the scale had a zero balance error of -10 pounds.

(See the reverse side of this sheet for an outline of the test method and a statement of the applicable tolerances and SR limits)

11—11869

Digitized by Google

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
WASHINGTON, D. C.

SUPPLEMENT TO REPORT OF VEHICLE-SCALE TEST

1. *Test loads.*—The total test-weight load available consists of fifteen 1,000-pound weights. The strain load consists of a vehicle, placed on the scale platform to put the scale parts and structure under an initial load preparatory to a reapplication of the test weights; in the case of a scale of very large capacity, strain loads of different weights may be applied, if deemed necessary.

2. *Test method.*—The regular test of a vehicle scale of a capacity of 40,000 pounds or more, consists of (*a*) the application of test-weight loads up to 15,000 pounds, at each end of the scale and divided between the ends; (*b*) the application of a strain load consisting of the carrying truck, balanced first with its rear wheels on one end of the scale platform and then with its position reversed; (*c*) the reapplication of the full test-weight load, by loading the weights into the carrying truck; and (*d*) reversal of the position of the loaded truck to place its rear wheels on the opposite end of the platform. If the nominal capacity of the scale is less than the combined weight of carrying truck and test weights, the number of weights reapplied as in (*c*) above will be so limited that the total load will not exceed the nominal scale capacity, and, if necessary and practicable, a strain load of lesser weight will be utilized. In the case of scales of relatively small capacity, the initial test-weight load is appropriately reduced and the strain load is omitted. The several elements of the scale are separately checked. In the case of a scale utilizing counterpoise weights the ratio errors of the scale are determined by using standard weights at the tip of the weighbeam, the scale counterpoise weights being separately tested on a balance against standard weights.

In the test of a wagon scale, the foregoing procedure is further modified to adapt it to such a scale; for example, end loading is restricted to one-half the nominal scale capacity and corner tests may be made in certain cases.

3. *Errors.*—The amount by which the scale indication differs from the value of the applied test-weight load is the error of the element or elements being tested, for the given position and for the test-weight load being utilized. If the scale indication exceeds the value of the test-weight load, the error is designated as plus (+); if the scale indication is less than the value of the test-weight load, the error is designated as minus (−). If a counterpoise weight is heavier than standard value, its error is designated as plus (+), and if it is lighter than standard value its error is designated as minus (−). (A counterpoise weight having a plus error will cause a minus weighing error when it is used on a scale, and vice versa.)

4. *Tolerances on scales.*—A scale is reported as accurate when its indications conform to standard values within the appropriate tolerances:

(*a*) Tolerance on weighbeam, or on reading face (in combination with unit weights if these are utilized): ±0.20 percent of the test-weight load being utilized, but with the appropriate minimum value following: On a beam scale or on beam of automatic-indicating scale; 5 pounds on each beam, when the minimum graduation of any beam with which the scale may be equipped is 2½ pounds or less; 10 pounds when such minimum graduation is 5 pounds or 10 pounds; 20 pounds when such minimum graduation is 20 pounds. On reading face of automatic-indicating scale; same values as above for equivalent minimum graduations on reading face.

(*b*) Tolerance on ratio of beam scales or automatic-indicating scales—applied to parts designed for use with manually removable counterpoise weights: ±0.15 percent of the test-weight load being utilized, but with a minimum value computed as in paragraph (*a*) from the element having the smallest graduations.

In the case of new scales, that is, scales newly installed and being tested for the first time or for acceptance on contract, the applicable tolerances are one-half those given above, except that the minimum tolerance shall be a value equivalent to one-half of one of the minimum weighbeam or reading-face graduations. In the case of automatic-indicating scales used exclusively in the determination of freight charges, the applicable tolerances are twice those given above.

5. *Tolerances on counterpoise weights.*—A counterpoise weight is reported as accurate when its value conforms to standard value within the appropriate tolerance: One-half pound weight, ±3 grains; one-pound weight, ±5 grains; two-pound weight, ±8 grains; four-pound weight, ±12 grains; five-pound weight, ±13 grains. In the case of new counterpoise weights, the applicable tolerances are one-half those given above.

6. *Sensibility reciprocal* (SR).—SR is a measure of the sensitiveness of a scale; it is the amount of weight required to move the position of equilibrium of the weighbeam, pointer, or other indicating device of the scale a definite amount, at the capacity or at any lesser load. SR does not apply to scales utilizing reading faces which indicate directly in terms of weight.

The SR of a vehicle scale of the beam type is the change in load required to move the weighbeam from a position of equilibrium at the center of the trig loop to a position of equilibrium at the top or at the bottom of the trig loop, or if the scale is equipped with a device comprising an indicator cooperating with a single balance-indicating or "zero" graduation, or with a series of graduations which do not directly indicate weight values, the SR is the change in load required to move the indicator a specified distance from its position of equilibrium when the scale is in proper balance. A vehicle scale is reported as sufficiently sensitive if the maximum SR does not exceed the value of two of the minimum weighbeam graduations, except that the maximum SR allowable shall in no case be less than 10 pounds; in the case of a new scale the maximum SR shall not exceed one of the minimum weighbeam graduations.

7. *Identification of parts.*—When an observer is standing at the weighbeam or reading face of a scale and facing the platform, the "left" and "right" ends of the scale are those at the observer's left and right, respectively, and the "far" and "near" sides are, respectively, the one farther away from, and the one closer to, the observer.

8. *Regulations.*—The National Conference on Weights and Measures has adopted regulations providing: (*a*) That a scale shall not be used for weighing loads greater than its nominal or rated capacity; (*b*) that a scale shall be maintained in balance; (*c*) that a vehicle scale shall not be used for weighing loads of less than 1,000 pounds; and (*d*) that the value of the minimum weight graduations of a vehicle scale having a capacity of not more than 60,000 pounds, shall not exceed 20 pounds. These regulations are recommended by the National Bureau of Standards for adoption by the several States.

U. S. GOVERNMENT PRINTING OFFICE 11—11868

Digitized by Google

RESULTS OF INSPECTION AND RECOMMENDATIONS:

It was found on inspection of the scale that on the near side at the left end and on the far side at the right end of the scale the main bearing assemblies were badly out of plumb and the suspension bolts of the assemblies were not properly positioned on the rocker blocks, resulting in binding conditions at both points. It was also found that the scale pit, the lever system, and the pivots and bearings, were dirty, that the structural steel in the pit was rusting, that there were accumulations of dirt in the weighbeam notches, and that the weighbeam poise was in need of repair, the rack bar of the fractional poise having been broken. The platform planks were beginning to rot.

It is recommended that the scale pit and scale parts throughout be thoroughly cleaned and be maintained in clean condition. To protect the structural steel from deterioration this should be cleaned of rust and should be painted. The faulty conditions in the two bearing assemblies should be corrected. The weighbeam poise assembly should be reconditioned in a scale shop and resealed to correct value. At some convenient time suitable repairs should be made to the scale platform.

Following the repairs the scale should be retested and, if necessary, adjusted to weigh within approximately one-half the prescribed tolerance.

Insofar as practicable the approaches to the scale should be made straight and in the same plane as the scale platform for a reasonable distance at either end of the scale; where the approaches are inclined the scale assembly is subjected to unnecessary wear and possible derangement.

Lyman J. Briggs, Director

Washington, D. C.

Digitized by Google

Digitized by Google

Form 369

RWS:HER
II-7/Tw 79604

U. S. DEPARTMENT OF COMMERCE

National Bureau of Standards

REPORT OF VEHICLE SCALE TEST

Scale owner: Date of test:

Scale location: Test number:

Scale description: 40,000-pound Motor-Truck Scale - Shop No.

The scale was tested with standard weights in an amount of 15,000 pounds in combination with a strain load of approximately 23,000 pounds.

The scale was found to be sufficiently sensitive, the maximum SR being 17 pounds. (The maximum allowable value for the SR of this scale is 20 pounds.)

The scale was found to be accurate within the applicable tolerances.

The fractional and tare weighbeam bars were separately checked and their indications were found to be in agreement with those of the main weighbeam bar.

There was found at the scale an improvised counterpoise weight marked to show that it had a counterpoise value of 4320 pounds. It is reported that this weight is used upon occasion to weigh loads in excess of the rated capacity of the scale. This weight is not of approved construction and upon test was found to be inaccurate. It is recommended that the weight be discarded.

RESULTS OF INSPECTION AND RECOMMENDATIONS:

The scale was found on inspection to have been very well installed and in general to be in a very good state of maintenance. The beam rod was found to be very slightly out of plumb and the two main-load bearing assemblies on the near side were slightly out of plumb; these conditions are not sufficiently serious to require attention at this time. Some accumulations of sand were found around the pivots and bearings of the lever system. It is suggested that these parts be cleaned and be then repacked with fresh grease. The installation of dirt shields over the load-bearing assemblies is suggested to prevent the accumulation of dirt on these parts.

Lyman J. Briggs, Director

Washington, D. C.

[See the reverse side of this sheet for an outline of the test method and a statement of the applicable tolerances and SR limits]

11—11868

Digitized by Google

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
WASHINGTON, D. C.

SUPPLEMENT TO REPORT OF VEHICLE-SCALE TEST

1. *Test loads.*—The total test-weight load available consists of fifteen 1,000-pound weights. The strain load consists of a vehicle, placed on the scale platform to put the scale parts and structure under an initial load preparatory to a reapplication of the test weights; in the case of a scale of very large capacity, strain loads of different weights may be applied, if deemed necessary.

2. *Test method.*—The regular test of a vehicle scale of a capacity of 40,000 pounds or more, consists of (*a*) the application of test-weight loads up to 15,000 pounds, at each end of the scale and divided between the ends; (*b*) the application of a strain load consisting of the carrying truck, balanced first with its rear wheels on one end of the scale platform and then with its position reversed; (*c*) the reapplication of the full test-weight load, by loading the weights into the carrying truck; and (*d*) reversal of the position of the loaded truck to place its rear wheels on the opposite end of the platform. If the nominal capacity of the scale is less than the combined weight of carrying truck and test weights, the number of weights reapplied as in (*c*) above will be so limited that the total load will not exceed the nominal scale capacity, and, if necessary and practicable, a strain load of lesser weight will be utilized. In the case of scales of relatively small capacity, the initial test-weight load is appropriately reduced and the strain load is omitted. The several elements of the scale are separately checked. In the case of a scale utilizing counterpoise weights the ratio errors of the scale are determined by using standard weights at the tip of the weighbeam, the scale counterpoise weights being separately tested on a balance against standard weights.

In the test of a wagon scale, the foregoing procedure is further modified to adapt it to such a scale; for example, end loading is restricted to one-half the nominal scale capacity and corner tests may be made in certain cases.

3. *Errors.*—The amount by which the scale indication differs from the value of the applied test-weight load is the error of the element or elements being tested, for the given position and for the test-weight load being utilized. If the scale indication exceeds the value of the test-weight load, the error is designated as plus (+); if the scale indication is less than the value of the test-weight load, the error is designated as minus (−). If a counterpoise weight is heavier than standard value, its error is designated as plus (+), and if it is lighter than standard value its error is designated as minus (−). (A counterpoise weight having a plus error will cause a minus weighing error when it is used on a scale, and vice versa.)

4. *Tolerances on scales.*—A scale is reported as accurate when its indications conform to standard values within the appropriate tolerances:

(*a*) Tolerance on weighbeam, or on reading face (in combination with unit weights if these are utilized): ±0.20 percent of the test-weight load being utilized, but with the appropriate minimum value following: On a beam scale or on beam of automatic-indicating scale; 5 pounds on each beam, when the minimum graduation of any beam with which the scale may be equipped is 2½ pounds or less; 10 pounds when such minimum graduation is 5 pounds or 10 pounds; 20 pounds when such minimum graduation is 20 pounds. On reading face of automatic-indicating scale; same values as above for equivalent minimum graduations on reading face.

(*b*) Tolerance on ratio of beam scales or automatic-indicating scales—applied to parts designed for use with manually removable counterpoise weights: ±0.15 percent of the test-weight load being utilized, but with a minimum value computed as in paragraph (*a*) from the element having the smallest graduations.

In the case of new scales, that is, scales newly installed and being tested for the first time or for acceptance on contract, the applicable tolerances are one-half those given above, except that the minimum tolerance shall be a value equivalent to one-half of one of the minimum weighbeam or reading-face graduations. In the case of automatic-indicating scales used exclusively in the determination of freight charges, the applicable tolerances are twice those given above.

5. *Tolerances on counterpoise weights.*—A counterpoise weight is reported as accurate when its value conforms to standard value within the appropriate tolerance: One-half pound weight, ±3 grains; one-pound weight, ±5 grains; two-pound weight, ±8 grains; four-pound weight, ±12 grains; five-pound weight, ±13 grains. In the case of new counterpoise weights, the applicable tolerances are one-half those given above.

6. *Sensibility reciprocal* (SR).—SR is a measure of the sensitiveness of a scale; it is the amount of weight required to move the position of equilibrium of the weighbeam, pointer, or other indicating device of the scale a definite amount, at the capacity or at any lesser load. SR does not apply to scales utilizing reading faces which indicate directly in terms of weight.

The SR of a vehicle scale of the beam type is the change in load required to move the weighbeam from a position of equilibrium at the center of the trig loop to a position of equilibrium at the top or at the bottom of the trig loop, or if the scale is equipped with a device comprising an indicator cooperating with a single balance-indicating or "zero" graduation, or with a series of graduations which do not directly indicate weight values, the SR is the change in load required to move the indicator a specified distance from its position of equilibrium when the scale is in proper balance. A vehicle scale is reported as sufficiently sensitive if the maximum SR does not exceed the value of two of the minimum weighbeam graduations, except that the maximum SR allowable shall in no case be less than 10 pounds; in the case of a new scale the maximum SR shall not exceed one of the minimum weighbeam graduations.

7. *Identification of parts.*—When an observer is standing at the weighbeam or reading face of a scale and facing the platform, the "left" and "right" ends of the scale are those at the observer's left and right, respectively, and the "far" and "near" sides are, respectively, the one farther away from, and the one closer to, the observer.

8. *Regulations.*—The National Conference on Weights and Measures has adopted regulations providing: (*a*) That a scale shall not be used for weighing loads greater than its nominal or rated capacity; (*b*) that a scale shall be maintained in balance; (*c*) that a vehicle scale shall not be used for weighing loads of less than 1,000 pounds; and (*d*) that the value of the minimum weight graduations of a vehicle scale having a capacity of not more than 60,000 pounds, shall not exceed 20 pounds. These regulations are recommended by the National Bureau of Standards for adoption by the several States.

U. S. GOVERNMENT PRINTING OFFICE 11—11908

Digitized by Google

Digitized by Google

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

REPORT OF THE TWENTY-EIGHTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

ATTENDED BY REPRESENTATIVES
FROM VARIOUS STATES

HELD AT THE NATIONAL BUREAU OF STANDARDS
WASHINGTON, D. C., MAY 31, JUNE 1, 2, AND 3, 1938

MISCELLANEOUS PUBLICATION M161

UNIVERSITY
LIBRARY
Digitized by Google

Digitized by Google

Digitized by Google



Official photograph of delegates and guests attending the Twenty-eighth National Conference on Weights and Measures, assembled at the entrance of the East Building, National Bureau of Standards.

Digitized by Google

U. S. DEPARTMENT OF COMMERCE
HARRY L. HOPKINS, Secretary
NATIONAL BUREAU OF STANDARDS
LYMAN J. BRIGGS, Director

MISCELLANEOUS PUBLICATION M161

REPORT OF THE TWENTY-EIGHTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

ATTENDED BY REPRESENTATIVES
FROM VARIOUS STATES

HELD AT THE NATIONAL BUREAU OF STANDARDS
WASHINGTON, D. C., MAY 31, JUNE 1, 2, AND 3, 1938

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1939

For sale by the Superintendent of Documents, Washington, D. C. - - - - - - - - - - - - - - Price 30 cents

Digitized by Google

Digitized by Google

OFFICERS AND COMMITTEES

OFFICERS

(Serving during Twenty-eighth National Conference)

President, LYMAN J. BRIGGS, Director, National Bureau of Standards, Washington, D. C.
Vice Presidents:
W. S. BUSSEY, Chief, State Division of Weights and Measures, Austin, Tex.
C. J. P. CULLEN, Director, State Bureau of Standard Weights and Measures, Harrisburg, Pa.
JOHN J. LEVITT, State Superintendent of Standards, Springfield, Ill.
ROLLIN E. MEEK, Chief, State Bureau of Weights and Measures, Indianapolis, Ind.
Secretary, F. S. HOLBROOK, National Bureau of Standards, Washington, D. C.
Treasurer, GEORGE F. AUSTIN, Jr., Supervising Inspector of Weights and Measures, Detroit, Mich.

(As elected by the Twenty-eighth National Conference for the ensuing year)

President, LYMAN J. BRIGGS, Director, National Bureau of Standards, Washington, D. C.
Vice Presidents:
W. S. BUSSEY, Chief, State Division of Weights and Measures, Austin, Tex.
ROLLIN E. MEEK, Chief, State Bureau of Weights and Measures, Indianapolis, Ind.
CHARLES C. READ, Superintendent, State Department of Weights and Measures, Trenton, N. J.
C. E. TUCKER, Chief, State Division of Weights and Measures, Sacramento, Calif.
HOWARD E. CRAWFORD, City Inspector of Weights and Measures, Jacksonville, Fla.
B. W. RAGLAND, Chief, Bureau of Weights and Measures, Richmond, Va.
Secretary, F. S. HOLBROOK, National Bureau of Standards, Washington, D. C.
Treasurer, GEORGE F. AUSTIN, Jr., Supervising Inspector of Weights and Measures, Detroit, Mich.

COMMITTEES

EXECUTIVE COMMITTEE

(As elected by Twenty-eighth National Conference)

LYMAN J. BRIGGS
W. S. BUSSEY
ROLLIN E. MEEK
CHARLES C. READ
C. E. TUCKER
HOWARD E. CRAWFORD
B. W. RAGLAND
F. S. HOLBROOK
GEORGE F. AUSTIN, Jr.
} *Ex officio.*

JAMES A. BOYLE, Sealer of Weights and Measures, Portland, Maine.
CHARLES H. BULSON, Sealer of Weights and Measures of Jefferson County, Theresa, N. Y.
C. J. P. CULLEN, Director, State Bureau of Standard Weights and Measures, Harrisburg, Pa.
H. N. DAVIS, Deputy State Commissioner of Weights and Measures, Montpelier, Vt.
EDWARD R. FISHER, Chief, State Bureau of Weights and Measures, Providence, R. I.
S. T. GRIFFITH, Chief, Division of Weights and Measures, Baltimore, Md.

Digitized by Google

FRANK L. HAMMON, Director, State Bureau of Weights and Measures, Boise, Idaho.
A. J. JENSEN, Chief State Inspector of Weights and Measures, Jamestown, N. D.
C. L. KLOCKER, State Inspector of Weights and Measures, Hartford, Conn.
JOHN P. MCBRIDE, Director, State Division of Standards, Boston, Mass.
JAMES O'KEEFE, Sealer of Weights and Measures, Chicago, Ill.
W. P. REED, Inspector of Weights and Measures, Atlanta, Ga.
GEORGE M. ROBERTS, District Superintendent of Weights, Measures, and Markets, Washington, D. C.
LOUIS G. WALDMAN, Commissioner of Weights and Measures, St. Louis, Mo.
GEORGE WARNER, Chief State Inspector of Weights and Measures, Madison, Wis.
WILLIAM C. WITFOTH, Sealer of Weights and Measures, Toledo, Ohio.

COMMITTEE ON SPECIFICATIONS AND TOLERANCES

(Standing committee)

F. S. HOLBROOK, National Bureau of Standards, Washington, D. C., chairman.
CHARLES M. FULLER, Sealer of Weights and Measures of Los Angeles County, Los Angeles, Calif.
JOSEPH G. ROGERS, Assistant State Superintendent of Weights and Measures, Trenton, N. J.
JOHN P. MCBRIDE, Director, State Division of Standards, Boston, Mass.
GEORGE F. AUSTIN, Jr., Supervising Inspector of Weights and Measures, Detroit, Mich.

COMMITTEE ON PUBLICITY

(Standing committee)

GEORGE M. ROBERTS, District Superintendent of Weights, Measures, and Markets, Washington, D. C., chairman.
GLENN L. BERRY, Superintendent of Weights and Measures of Monmouth County, Asbury Park, N. J.
W. S. BUSSEY, Chief, State Division of Weights and Measures, Austin, Tex.
C. L. KLOCKER, State Inspector of Weights and Measures, Hartford, Conn.
LOUIS G. WALDMAN, Commissioner of Weights and Measures, St. Louis, Mo.

COMMITTEE ON PROPOSED FEDERAL LEGISLATION TO PROVIDE ASSISTANCE FOR THE STATES IN ADMINISTRATION OF WEIGHTS AND MEASURES LAWS

JOHN P. MCBRIDE, Director, State Division of Standards, Boston, Mass., chairman.
FRANK L. HAMMON, Director, State Bureau of Weights and Measures, Boise, Idaho.
ROLLIN E. MEEK, Chief, State Bureau of Weights and Measures, Indianapolis, Ind.
J. H. MEEK, Director, State Division of Markets, Richmond, Va.
CHARLES C. READ, Superintendent, State Department of Weights and Measures Trenton, N. J.
S. T. GRIFFITH, Chief, City Division of Weights and Measures, Baltimore, Md.
W. P. REED, City Inspector of Weights and Measures, Atlanta, Ga.

ACTING COMMITTEES FOR THE TWENTY-EIGHTH NATIONAL CONFERENCE

Committee on Nominations. O. E. BRENNEMAN, of Ohio, chairman; W. S. BUSSEY, of Texas; WILLIAM FOSTER, of Springfield, Mass.; A. J. JENSEN, of North Dakota; JOHN J. LEVITT, of Illinois; B. W. RAGLAND, of Richmond, Va.; and GILBERT S. SMITH, of Cape May County, N. J.

Committee on Resolutions. C. L. KLOCKER, of Connecticut, chairman; MANON L. FOWLER, of Highland Park, Mich.; GARDNER K. HEATH, of Maine; BARNETT KANZER, of New York; HOWARD C. PATTON, of Pittsburgh, Pa.; ERWIN J. ROGERS, of West Allis, Wis.; and C. E. TUCKER, of California.

In Charge of Exhibits. B. L. PAGE.

In Charge of Registrations. MRS. H. E. ROSENBERGER.

Digitized by Google

PERSONS ATTENDING THE CONFERENCE

DELEGATES—STATE, CITY, AND COUNTY OFFICIALS

ALABAMA

State	J. C. LOVELACE, Inspector of Weights and Measures, 515 Dexter Avenue, Montgomery.
	E. W. PINNELL, Inspector of Weights and Measures, 515 Dexter Avenue, Montgomery.
City: Birmingham	R. M. JOHNSON, Chief Inspector of Weights and Measures, City Hall.

CALIFORNIA

State	C. E. TUCKER, Chief, Division of Weights and Measures, State Building, Sacramento.
County: Los Angeles	CHARLES M. FULLER, Sealer of Weights and Measures, 501 New High Street, Los Angeles.

CONNECTICUT

State	C. L. KLOCKER, Inspector of Weights and Measures, 100 Washington Street, Hartford.
City: Hartford	THOMAS F. RICE, Sealer of Weights and Measures, Municipal Building.
County:	
Hartford	M. C. GRIFFIN, Sealer of Weights and Measures, 95 Washington Street, Hartford.
Middlesex	G. ERNEST HUBBARD, Sealer of Weights and Measures, Middletown.

DISTRICT OF COLUMBIA

District	GEORGE M. ROBERTS, Superintendent of Weights, Measures, and Markets, 467 C Street, Washington.

FLORIDA

City: Jacksonville	HOWARD E. CRAWFORD, Inspector of Weights and Measures, Utilities Building.

GEORGIA

State	S. H. WILSON, State Oil Chemist, State Capitol, Atlanta.
City: Atlanta	W. P. REED, Inspector of Weights and Measures, Police Headquarters.

IDAHO

State	FRANK L. HAMMON, Director, Bureau of Weights and Measures, State House, Boise.

ILLINOIS

State	JOHN J. LEVITT, Superintendent of Standards, Armory Building, Springfield.
City: Chicago	JAMES O'KEEFE, Sealer of Weights and Measures, City Hall.

INDIANA

State	HENRY F. SCHRICKER, Lieutenant-Governor, State House, Indianapolis.
	ROLLIN E. MEEK, Chief, Bureau of Weights and Measures, State House Annex, Indianapolis.

Digitized by Google

City:	
Gary	CLEO C. MORGAN, Sealer of Weights and Measures.
Terre Haute	A. EDWARD SNYDER, Inspector of Weights and Measures, City Hall.

MAINE

State	G. K. HEATH, Deputy Sealer of Weights and Measures, Augusta.
City:	
Augusta	JOSEPH A. LEE, JR., Sealer of Weights and Measures, Riverside Drive.
Portland	JAMES A. BOYLE, Sealer of Weights and Measures, City Building.
Waterville	WILLIAM A. JONES, Sealer of Weights and Measures, City Hall.

MARYLAND

City: Baltimore	S. T. GRIFFITH, Chief, Division of Weights and Measures, Municipal Building. CHARLES G. CROCKETT, Inspector of Weights and Measures, Municipal Building. JOHN R. GRAEFF, Inspector of Weights and Measures, Municipal Building. GEORGE H. LEITHAUSER, Inspector of Weights and Measures, Municipal Building. THOMAS J. NAPFEL, Inspector of Weights and Measures, Municipal Building. ELMER E. NICHOLSON, Inspector of Weights and Measures, Municipal Building. FRED J. O'GORMAN, Inspector of Weights and Measures, Municipal Building. ELMER S. PIERPONT, Inspector of Weights and Measures, Municipal Building. HENRY J. SLITZER, Assistant Inspector of Weights and Measures, Municipal Building.

MASSACHUSETTS

State	JOHN P. MCBRIDE, Director of Standards, State House, Boston. WALTER W. GLEASON, Inspector of Standards, 476 Main St., Worcester, Mass.
City:	
Arlington	ALLAN E. COWIE, Sealer of Weights and Measures, Town Hall.
Newton Centre	ANDREW PRIOR, Sealer of Weights and Measures, City Hall.
Springfield	WILLIAM FOSTER, Sealer of Weights and Measures, City Hall.
Taunton	EDWARD C. WARD, Sealer of Weights and Measures, City Hall.

MICHIGAN

State	LEO V. CARD, Director, Bureau of Foods and Standards, Lansing. LOUIS A. HAIGHT, Chief Inspector, Bureau of Foods and Standards, Lansing.
City:	
Detroit	GEORGE F. AUSTIN, Jr., Supervising Inspector of Weights and Measures, 740 Elmwood Avenue.
Hamtramck	ARTHUR J. WILHELM, Sealer of Weights and Measures.
Highland Park	MANON L. FOWLER, Sealer of Weights and Measures, 25 Gerald Street.
Lansing	CHARLES T. QUINN, Sealer of Weights and Measures, City Market.

Digitized by Google

MISSOURI

City:	
St. Louis	LOUIS G. WALDMAN, Commissioner of Weights and Measures, City Hall.
Springfield	A. HARMAN, Sealer of Weights and Measures, City Hall.

NEW JERSEY

State	CHARLES C. READ, Superintendent of Weights and Measures, 187 West Hanover Street, Trenton.
	JOSEPH G. ROGERS, Assistant Superintendent of Weights and Measures, 187 West Hanover Street, Trenton.
	ROWLAND K. BODENWIESER, Assistant Superintendent of Weights and Measures, 187 West Hanover Street, Trenton.
	ARCHIE T. SMITH, Inspector of Weights and Measures, 187 West Hanover Street, Trenton.
City:	
Bayonne	WALTER J. FLYNN, Superintendent of Weights and Measures, Municipal Building.
Clifton	GARRET H. DEVRIES, Superintendent of Weights and Measures, City Hall.
Elizabeth	WILLIAM J. BENDER, Superintendent of Weights and Measures, City Hall.
Englewood	LEONARD DERIENZO, Superintendent of Weights and Measures, Municipal Building.
Jersey City	JOHN S. BURKE, Superintendent of Weights and Measures, City Hall.
Linden	CORNELIUS O'DONNELL, Superintendent of Weights and Measures, City Hall.
Passaic	PETER J. GALLAGHER, Superintendent of Weights and Measures, Municipal Building.
	ABE VAN BROOKHOVEN, Assistant Superintendend of Weights and Measures, Municipal Building.
Paterson	JOSEPH P. LEONARD, Superintendent of Weights and Measures, 115 Van Hounten Street.
Perth Amboy	JOHN FARKAS, Jr., Superintendent of Weights and Measures.
Union City	ALFRED O. OSLUND, Superintendent of Weights and Measures, City Hall.
County:	
Bergen	ALFRED F. BARNARD, Superintendent of Weights and Measures, Hackensack.
Burlington	CURWEN B. FISHER, Superintendent of Weights and Measures, Mount Holly.
	CLARENCE C. MATTIS, Assistant Superintendent of Weights and Measures, Riverton.
Cape May	GILBERT S. SMITH, Superintendent of Weights and Measures, Avalon.
Mercer	RALPH M. BODENWEISER, Superintendent of Weights and Measures, Court House, Trenton.
Middlesex	CHARLES H. ENGELHARD, Superintendent of Weights and Measures, County Offices, New Brunswick.
Monmouth	GLENN L. BERRY, Superintendent of Weights and Measures, 706 Eighth Avenue, Asbury Park.
	JOHN SACCO, Jr., Assistant Superintendent of Weights and Measures, 123 South Seventh Avenue, Long Branch.
Passaic	WILLIAM MILLER, Superintendent of Weights and Measures, Court House, Paterson.
Somerset	O. B. MATHEWS, Superintendent of Weights and Measures, Court House, Somerville.
Sussex	R. L. SLATER, Superintendent of Weights and Measures, Newton.

Digitized by Google

County—Continued.	
Union	CHARLES E. AYERS, Superintendent of Weights and Measures, Court House, Elizabeth.
Warren	CLAIRE E. TILTON, Superintendent of Weights and Measures, Phillipsburg.
	NEW YORK
State	BARNETT KANZER, Director, Bureau of Weights and Measures, State Office Building, Albany.
City:	
Buffalo	LOUIS J. SCHUSTER, Sealer of Weights and Measures, City Hall.
Lackawanna	JOHN J. SERES, Sealer of Weights and Measures, City Hall.
New Rochelle	DUDLEY H. GOLDSMITH, Sealer of Weights and Measures.
New York	ALEX PISCIOTTA, Director, Bureau of Weights and Measures, 139 Centre Street.
	MATTHIAS A. HARRINGTON, Chief Inspector of Weights and Measures, 139 Centre Street.
	CHARLES J. MURPHY, Inspector of Weights and Measures, 139 Centre Street.
Poughkeepsie	LOUIS J. HOFFMAN, Sealer of Weights and Measures, City Hall.
Rochester	ANTHONY C. SAMENFINK, Sealer of Weights and Measures, Public Market.
County:	
Jefferson	CHARLES H. BULSON, Sealer of Weights and Measures, Theresa.
Monroe	HARVEY C. FERGUSON, Inspector of Weights and Measures, 1400 South Avenue, Rochester.
Nassau	ROBERT WILLIAMS, Sealer of Weights and Measures, Court House Annex, Mineola.
	WILLIAM KIRK, Jr., Deputy Sealer of Weights and Measures, 518 Sheridan Boulevard, Inwood, L. I.
Niagara	E. M. COYLE, Sealer of Weights and Measures, Lockport.
Oneida	R. D. SPENCER, Sealer of Weights and Measures, Court House, Utica.
	ANDREW E. WAGNER, Deputy Sealer of Weights and Measures, 520 North Jay Street, Rome.
Oswego	LELAND M. FLOWER, Sealer of Weights and Measures, Lycoming.
Suffolk	C. P. SMITH, Sealer of Weights and Measures, P. O. Box 412, East Moriches.
	NORTH CAROLINA
State	C. D. BAUCOM, Superintendent of Weights and Measures, Raleigh.
	H. W. HOOD, Inspector of Weights and Measures, Raleigh.
	GEORGE S. TURNER, Jr., Inspector of Weights and Measures, Raleigh.
	H. L. SHANKLE, Chief, Gasoline and Oil Inspection Division, Department of Revenue, Raleigh.
City: Raleigh	G. R. STALLINGS, Inspector of Weights and Measures, City Hall.
City and County: Charlotte, and Mecklenburg County.	F. C. YARBROUGH, Inspector of Weights and Measures, 300 South Poplar Street, Charlotte.
	NORTH DAKOTA
State	A. J. JENSEN, Chief Inspector of Weights and Measures. Jamestown.

Digitized by Google

OHIO

State—O. E. Brenneman, Chief Deputy Sealer, Bureau of Weights and Measures, State Office Building, Columbus.
City: Toledo—William C. Witfoth, Sealer of Weights and Measures, 561 Erie Street.
County: Hamilton—Edwin J. Siegler, Deputy Sealer of Weights and Measures, Court House, Cincinnati.

OREGON

State—Arden A. Reed, Deputy Sealer of Weights and Measures, Salem.

PENNSYLVANIA

State—C. J. P. Cullen, Director, Bureau of Standard Weights and Measures, Harrisburg.
W. E. Moody, Deputy Inspector of Weights and Measures, Chestnut Ridge.
City:
Harrisburg—George B. Nebinger, Inspector of Weights and Measures.
Pittsburgh—Howard C. Patton, Superintendent of Weights and Measures, City and County Building.
John J. McParland, Weights and Measures, Inspector, City and County Building.
Reading—William A. High, Inspector of Weights and Measures, City Hall.
York—Irwin R. Shultz, Inspector of Weights and Measures, City Hall.
County:
Allegheny—P. J. Hunter, Inspector of Weights and Measures, Court House, Pittsburgh.
Nicholas Stabile, County Statistician, Court House, Pittsburgh.
Franklin—Roy G. Kell, Sealer of Weights and Measures, Chambersburg.
Lehigh—Harry E. Biery, Inspector of Weights and Measures, Allentown.
Montgomery—William H. Jones, Supervisor of Weights and Measures, Court House, Norristown.
Philadelphia—James M. Henneberry, Supervisor of Weights and Measures, 241 Wolf Street, Philadelphia.
Union—Hobert R. Spaid, Sealer of Weights and Measures, 517 Market Street, Mifflinburg.

RHODE ISLAND

State—Edward R. Fisher, Chief, Bureau of Weights and Measures, State House, Providence.

TENNESSEE

City: Nashville—Tom Webb, Sealer of Weights and Measures, City Hall.

TEXAS

State—J. E. McDonald, Commissioner of Agriculture, Austin.
W. S. Bussey, Chief, Division of Weights and Measures, Austin.
J. E. Liles, Inspector of Weights and Measures, 3300 North Flores Street, San Antonio.
H. R. Tarwater, Inspector of Weights and Measures, Lubbock.
M. S. Fraze, Director of Markets and Warehouses, Austin.

Digitized by Google

City: Dallas	R. L. FULLEN, Chief, Division of Weights and Measures, City Hall.

VERMONT

State	H. N. DAVIS, Deputy Commissioner of Weights and Measures, Montpelier.

VIRGINIA

State	J. H. MEEK, Director, Division of Markets, State Office Building, Richmond.
	M. A. HUBBARD, Supervisor of Weights and Measures, State Office Building, Richmond.
City:	
Newport News	H. G. TWYFORD, Sealer of Weights and Measures, City Hall.
Richmond	B. W. RAGLAND, Chief, Bureau of Weights and Measures, City Hall Annex.
	J. B. ECK, Inspector of Weights and Measures, City Hall Annex.
	M. L. RICE, Inspector of Weights and Measures, City Hall Annex.
County: Arlington	E. M. MORELAND, Sealer of Weights and Measures, Court House, Arlington.

WEST VIRGINIA

State	C. L. JARRETT, Commissioner of Weights and Measures, Capitol Building, Charleston.
	S. M. MILLER, State Scale Inspector, R. F. D. No. 3, Martinsburg.
	WM. ROGERS, State Scale Inspector, R. F. D. No. 1, Fairmont.
County:	
Marion	H. D. MARTIN, Sealer of Weights and Measures, Fairmont.
Wayne	MRS. JESSIE ROBERTS, Sealer of Weights and Measures, Fort Gay.
Wood	H. A. WATKINS, Sealer of Weights and Measures, Court House, Parkersburg.

WISCONSIN

City: West Allis	ERWIN J. ROGERS, Sealer of Weights and Measures.

OTHER DELEGATES, AND GUESTS APPEARING ON THE PROGRAM

BEAN, H. S., National Bureau of Standards, Washington, D. C.
BEARCE, H. W., National Bureau of Standards, Washington, D. C.
BRIGGS, LYMAN J., Director, National Bureau of Standards, Washington, D. C.
CAREY, L. C., Specialist in Package Standardization, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.
CROUCH, RALPH W., JR., National Bureau of Standards, Washington, D. C.
GOULD, R. E., National Bureau of Standards, Washington, D. C.
HEM, H. O., President, National Scale Men's Association, Toledo, Ohio.
HOLBROOK, F. S., National Bureau of Standards, Washington, D. C.
HORTON, C. F., National Bureau of Standards, Washington, D. C.
JUDSON, L. V., National Bureau of Standards, Washington, D. C.
LEWIS, HERBERT B., Brown & Sharpe Manufacturing Co., Providence, R. I.
MEYER, J. FRANKLIN, National Bureau of Standards, Washington, D. C.
MILLER, D. R., National Bureau of Standards, Washington, D. C.
MONTGOMERY, D. E., Consumers' Counsel, Agricultural Adjustment Administration, United States Department of Agriculture, Washington, D. C.
PATTERSON, HON. RICHARD C., JR., Assistant Secretary of Commerce, Washington, D. C.
PEFFER, E. L., National Bureau of Standards, Washington, D. C.
PIENKOWSKY, A. T., National Bureau of Standards, Washington, D. C.

Digitized by Google

RICHARD C. L., National Bureau of Standards Master Scale Depot, Clearing Station, Chicago, Ill.
SMITH, RALPH W., National Bureau of Standards, Washington, D. C.
SOUDER, WILMER, National Bureau of Standards, Washington, D. C.

GUESTS REPRESENTING MANUFACTURERS OF WEIGHING AND MEASURING DEVICES

American Can Co.: HENRY B. TOURTELLOT, 230 Park Avenue, New York, N. Y.
Barnes Products (Inc.): W. J. BARNES, President, 6521 John R Street, Detroit, Mich.
Black & Decker Manufacturing Co.:
E. E. POWELL, Manager, Loadometer Sales, Towson, Md.
ALONZO G. DECKER, Jr., Engineer, Towson, Md.
DAVID MIDDLEMAN, Engineer, Towson, Md.
Bowser, S. F., & Co. (Inc.):
E. C. MARSH, Vice President, Fort Wayne, Ind.
C. P. GRIFFITH, Chief Engineer, Fort Wayne, Ind.
Brodie, Ralph N., Co. (Inc.): D. W. KINGSLEY, Eastern Manager, 425 Chrysler Building, New York, N. Y.
Brown & Sharpe Manufacturing Co.: HERBERT B. LEWIS, Providence, R. I.
Chatillon, John, & Sons:
P. T. BORTELL, Vice President, 89 Cliff Street, New York, N. Y.
J. GEORGE HUGEL, 89 Cliff Street, New York, N. Y.
Dayton Pump and Manufacturing Co.: G. W. EICHHOFF, Eastern Manager, 441 Lexington Avenue, New York, N. Y.
Erie Meter Systems (Inc.):
L. R. OLSEN, Chief Engineer, P. O. Box 559, Erie, Pa.
H. S. PELL, Manager of Sales, Erie, Pa.
Exact Weight Scale Co.: JAMES F. BALDWIN, 309 American Building, Baltimore, Md.
Fair Scale Co.:
AUGUST VETH, 1010 West Main Street, Louisville, Ky.
ALBERT VETH, Jr., 1010 West Main Street, Louisville, Ky.
Fairbanks, Morse & Co.:
W. C. GANTT, General Scale Sales Division, 600 South Michigan Avenue, Chicago, Ill.
C. A. HENNIE, Government Scale Sales Representative, 205 Water Street, Baltimore, Md.
JEROME KENNEY, Sales Representative, New York, N. Y.
E. W. MORGAN, Sales Representative, 129 West Boulevard, Charlotte, N. C.
Gas and Oil Lock Corporation:
M. S. YOUNG, President, 369 Lexington Avenue, New York, N. Y.
K. L. BRIDGES, Sales Engineer, 369 Lexington Avenue, New York, N. Y.
E. J. ELLIS, Salesman, 369 Lexington Avenue, New York, N. Y.
Gilbert & Barker Manufacturing Co.:
J. A. LOGAN, Manager, New Products and Patents Division, Springfield, Mass.
D. F. HARDIMAN, Salesman, P. O. Box 238, Richmond, Va.
W. M. HARKS, Sales Engineer, Springfield, Mass.
Gurley, W. & L. E.: ROBERT G. BETTS, Sales Representative, Troy, N. Y.
Hobart Manufacturing Co.:
KENNETH C. ALLEN, Development Engineer, Dayton Scale Division, Dayton, Ohio.
S. M. TEMPLETON, Special Representative, Dayton Scale Division, 914 Girard Avenue, Philadelphia, Pa.
Howe Scale Co.:
ELWOOD P. VROOME, Eastern Sales Manager, 111 Eighth Avenue, New York, N. Y.
C. A. LINDSAY, Special Representative, 1305 Euclid Street, Washington, D. C.
Hussmann Ligonier, JERE F. GAINOR, Special Representative, 2401 North Leffingwell Avenue, St. Louis, Mo.
Hydraulic Engineering Co.: R. S. BOHANNAN, Engineer, 1401 Lamb Avenue, Birmingham, Ala.
Jacobs Bros. Co. (Inc.):
H. M. JACOBS, Treasurer, Main and Water Streets, Brooklyn, N. Y.
J. E. WOODLAND, Sales Manager, Detectogram Division, Main and Water Streets, Brooklyn, N. Y.

Digitized by Google

L N S Corporation: WILLIAM H. LOLLEY, President, 30 Pine Street, New York, N. Y.
National Meter Co.:
R. H. BARGE, Development Engineer, 4207 First Avenue, Brooklyn, N. Y.
S. J. PASCUAL, Sales Engineer, 4207 First Avenue, Brooklyn, N. Y.
National Pumps Corporation: FRANK NEUSTADT, Chief Engineer, 520 Kiser Street, Dayton, Ohio.
National Store Specialty Co.:
W. E. SHEAFFER, General Manager, Bareville, Pa.
J. ROYER MILLER, Bareville, Pa.
Neptune Meter Co.: R. K. BLANCHARD, Vice President, 50 West Fiftieth Street, New York, N. Y.
Owens-Illinois Glass Co.:
E. F. GLACKEN, Eastern Sales Manager, Toledo, Ohio.
J. D. LAIRD, Supervisor of Specifications, Toledo, Ohio.
Peerless Weighing and Vending Machine Corporation: A. J. LILLIEDAHL, Service-Traffic Manager, 22–19 Forty-first Avenue, Long Island City, N. Y.
Pittsburgh Equitable Meter Co.:
H. I. BEARDSLEY, Manager, Oil and Gasoline Division, 400 North Lexington Avenue, Pittsburgh, Pa.
EDWARD R. EYLER, Sales Representative, 400 North Lexington Avenue, Pittsburgh, Pa.
Robinson Seal Co.:
C. J. ROBINSON, 170 Summer Street, Boston, Mass.
W. M. ROBINSON, 170 Summer Street, Boston, Mass.
Schirmer-Dornbirer Pump Co.: W. P. SCHIRMER, President, 1719 East Thirty-ninth Street, Cleveland, Ohio.
Seederer-Kohlbusch (Inc.): J. E. SEEDERER, President, 149 New York Avenue, Jersey City, N. J.
Seraphin Test Measure Co.: THEO. A. SERAPHIN, President, 1314 North Seventh Street, Philadelphia, Pa.
Service Station Equipment Co. (Inc.): ERIC H. BRADLEY, Chief Engineer, Muskegon, Mich.
Sharpsville Boiler Works Co.: CHARLES D. FAGAN, President, Sharpsville, Pa.
Smith Meter Co.:
ALLAN A. FLOYD, President, Los Angeles, Calif.
GLENN D. FRYE, Sales Manager, Chrysler Building, New York, N. Y.
Spinks Scale Co.: J. M. SPINKS, Manager, 656 Mayland Avenue, S. W., Atlanta, Ga.
Standard Computing Scale Co.: W. TOM WHITE, Assistant Supervisor of Sales, 2461 East Grand Boulevard, Detroit, Mich.
Streeter-Amet Co.: HARRY M. ROESER, Mechanical Engineer, 4101 Ravenswood Avenue, Chicago, Ill.
Tokheim Oil Tank & Pump Co.: G. U. BRAKE, Sales Engineer, Fort Wayne, Ind.
Toledo Scale Co.:
S. Q. BENNETT, Manager of Service and Weights and Measures, Toledo. Ohio.
H. O. HEM, Chief Engineer, Toledo, Ohio.
H. WARREN HEM, Engineer, Toledo, Ohio.
Triner Scale and Manufacturing Co.:
J. M. TRINER, President, Chicago, Ill.
C. G. OLSEN, Special Representative, Chicago, Ill.
Wayne Pump Co.:
CHARLES C. NEALE, Manager, Weights and Measures Division, Fort Wayne, Ind.
R. J. HEINEKAMP, 1000 Rhode Island Avenue, N. E., Washington, D. C.
Wood, Gar, Industries (Inc.): B. A. COOPER, Sales Engineer, Long Island City, N. Y.
Wood, John, Manufacturing Co. (Inc.): ERIC S. BERGMAN, Sales Manager, 420 Lexington Avenue, New York, N. Y.

GUESTS REPRESENTING TRADE AND ENGINEERING ASSOCIATIONS

American Petroleum Institute: DAVID V. STROOP, Engineer, 50 West Fiftieth Street, New York, N. Y.
Association of American Railroads, Engineering Division: M. J. J. HARRISON, Pennsylvania R. R., Altoona, Pa.
Gasoline Pump Manufacturers Association: G. DENNY MOORE, Managing Director, 420 Lexington Avenue, New York, N. Y.

Digitized by Google

Glass Container Association: VICTOR L. HALL, Secretary, 19 West Forty-fourth Street, New York, N. Y.
National Canners Association: CARLOS CAMPBELL, Director, Division of Statistics, 1739 H Street, Washington, D. C.
National Scale Men's Association: H. O. HEM, President, Toledo Scale Co., Toledo, Ohio.
National Truck Tank Association: J. E. JULIAN, Secretary, 120 South La Salle Street, Chicago, Ill.

GUESTS REPRESENTING BUSINESS AND INDUSTRY

BOHART, JAMES G., Sinclair Refining Co., 630 Fifth Avenue, New York, N. Y.
DAWSON, V. E., Mechanical Superintendent, Standard Oil Company of New Jersey, Baltimore, Md.
KENNEDY, L. L., Standard Oil Company of New Jersey, 15 Washington Street, Newark, N. J.
MARCHANT, HARRY, Scale Inspector, Bethlehem Steel Co., Sparrows Point, Md.
MCCOY, WILLIAM K., Instrument Engineer, Gulf Oil Corporation, Gulf Building, Pittsburgh, Pa.
NORMAN, C. H., Carolina Scale Shop, 112 East Morehead Street, Charlotte, N. C.
POWELSON, J. J., Assistant to Supervisor of Motor Equipment, Standard Oil Company of New Jersey, 26 Broadway, New York, N. Y.
SAYBOLT, J. W., Sales Manager, Standard Oil Company of New Jersey, 26 Broadway, New York, N. Y.
WOODWARD, C. P., Equipment Engineer, Shell Petroleum Corporation, Shell Building, St. Louis, Mo.

GUESTS REPRESENTING RAILROADS AND WEIGHING DEPARTMENTS

ALFREY, H. H., Chief Scale Inspector, Chicago, Rock Island and Pacific Railway Co., 1100 Fidelity Building, Kansas City, Mo.
CROWLEY, C. F., Supervisor of Weights, Western Weighing and Inspection Bureau, Union Station, Chicago, Ill.
HARRISON, M. J. J., Supervisor Scales and Weighing, Pennsylvania Railroad, Altoona, Pa.
LAWRENCE, E. KENT, General Scale Inspector, Baltimore & Ohio Railroad System, Baltimore, Md.
MANN, C. H., Superintendent of Scales, Southern Railway System, Washington, D. C.
MAYER, H., Supervisor of Scales, Chicago & Northwestern Railway Co., 400 West Madison Street, Chicago, Ill.
PHERIGO, J. L., Chief Scale Inspector, Southern Railway System, Washington, D. C.
PROPST, H. C., Chief Scale Inspector, Chesapeake & Ohio Railway Co., Richmond, Va.
RASK, R. O., Scale Inspector, Alton Railroad Co., Bloomington, Ill.

GUESTS REPRESENTING GOVERNMENT DEPARTMENTS

COREY, W. H., Senior Accountant, United States Tariff Commission, Washington, D. C.
HAMILTON, MABEL G., Special Expert, United States Tariff Commission, Washington, D. C.
MASON, CLAIRE, Special Expert, United States Tariff Commission, Washington, D. C.
MILLER, J. C., Equipment and Supplies Branch, United States Post Office Department, Washington, D. C.
STAM, LILLIAN R., Special Expert, United States Tariff Commission, Washington, D. C.

OTHER GUESTS

JACOBS, EDITH G., Secretary, Scale Journal Publishing Co., 1703 East Eighty-fourth Street, Chicago, Ill.

Digitized by Google

Digitized by Google

CONTENTS

Page

Officers and committees III
Persons attending the Conference V

FIRST SESSION—MORNING OF TUESDAY, MAY 31, 1938

Address by Lyman J. Briggs, Director, National Bureau of Standards, and President, National Conference on Weights and Measures 1
The viewpoint of industry concerned with interchangeable manufacturing toward the proposal to standardize the inch, by Herbert B. Lewis, Brown & Sharpe Manufacturing Co 2
Not in the book, by O. E. Brenneman, Chief Deputy Sealer, Bureau of Weights and Measures, State of Ohio 5
Activities of the National Scale Men's Association, by H. O. Hem, President, National Scale Men's Association 9
Labeling of incandescent-filament lamps, by J. Franklin Meyer, National Bureau of Standards 13
Demonstration of fuel-oil meter-testing equipment of the city of New York, by Alex Pisciotta, Director, Bureau of Weights and Measures, city of New York 17

SECOND SESSION—AFTERNOON OF TUESDAY, MAY 31, 1938

Announcement of special committee 19
Demonstration of recent developments in weighing and measuring apparatus, by representatives of manufacturers 19
New vehicle-scale testing equipment of Idaho, by Frank L. Hammon, Director, Bureau of Weights and Measures, State of Idaho 19
Parking meters, by H. W. Bearce, National Bureau of Standards 21
Discussion of above paper 25
Report on joint consideration of tolerances for vehicle scales by Committee on Specifications and Tolerances of the Conference and special committee of the National Scale Men's Association, presented by F. S. Holbrook, chairman of the Conference Committee 26
Discussion of above report 27

THIRD SESSION—MORNING OF WEDNESDAY, JUNE 1, 1938

Appointment of committees 28
Surveying weights and measures from the consumers' viewpoint, by D. E. Montgomery, Consumers' Counsel, Agricultural Adjustment Administration, United States Department of Agriculture 28
Discussion of above subject 34
Licensing of scale mechanics, by W. S. Bussey, Chief, Division of Weights and Measures, State of Texas 38
Discussion of above subject 40
Address by Hon. Richard C. Patterson, Jr., Assistant Secretary of Commerce 41
Paper measure-containers, by S. T. Griffith, Chief, Division of Weights and Measures, city of Baltimore, Md 44
Discussion of above subject 45
Abstracts of State reports:
Alabama, H. S. Holloway 45
California, C. E. Tucker 46
Connecticut, C. L. Klocker 46
District of Columbia, George M. Roberts 46
Florida, Howard E. Crawford 46
Georgia, S. H. Wilson 46
Idaho, Frank L. Hammon 47

Digitized by Google

Abstracts of State reports—Continued: Page
Illinois, John J. Levitt 47
Indiana, Rollin E. Meek 47
Maine, James A. Boyle 47
Maryland, S. T. Griffith 47
Massachusetts, John P. McBride 47
Michigan, Leo V. Card 48
Missouri, Louis G. Waldman 48
New Jersey, Joseph G. Rogers 48
New York, Barnett Kanzer 48
North Carolina, C. D. Baucom 48
North Dakota, A. J. Jensen 49
Announcement 49

FOURTH SESSION—AFTERNOON OF WEDNESDAY, JUNE 1, 1938

Abstracts of State reports—Continued:
Ohio, O. E. Brenneman 50
Oregon, Arden A. Reed 50
Pennsylvania, C. J. P. Cullen 50
Rhode Island, Edward R. Fisher 50
Tennessee, Tom Webb 51
Texas, W. S. Bussey 51
Vermont, H. N. Davis 51
Virginia, J. H. Meek 51
West Virginia, S. M. Miller 51
Wisconsin, George Warner 52
Reports of representatives of State associations of weights and measures officials 52
General consideration of subjects of interest and questions brought up for discussion by officials:
Interstate shipments of incorrect used apparatus 52
Standardization of packages 53

FIFTH SESSION—MORNING OF THURSDAY, JUNE 2, 1938

Two-draft weighing of motor-vehicle loads, by C. L. Richard, National Bureau of Standards 63
Method of test and inspection of vehicle scales developed by the National Bureau of Standards, by C. F. Horton, National Bureau of Standards 75
Discussion of above subject 79
Report of Committee on Proposed Federal Legislation to Provide Assistance for the States in Administration of Weights and Measures Laws, presented by John P. McBride, chairman 80
Discussion of above report 80
Report on the testing of vehicle scales by the National Bureau of Standards in cooperation with the States, by Ralph W. Smith, National Bureau of Standards 81
Newly installed motortruck scales, by F. S. Holbrook, National Bureau of Standards 88
Progress made toward procuring adequate vehicle-scale testing equipments:
Remarks of C. L. Klocker, Inspector of Weights and Measures, State of Connecticut 94
Paper of J. E. Liles, Inspector of Weights and Measures, State of Texas 95
Remarks of Charles M. Fuller, Sealer of Weights and Measures, county of Los Angeles, Calif 96

SIXTH SESSION—AFTERNOON OF THURSDAY, JUNE 2, 1938

Tour of the laboratories of the National Bureau of Standards 98

SEVENTH SESSION—MORNING OF FRIDAY, JUNE 3, 1938

Progress made toward procuring adequate vehicle-scale testing equipments—Continued:
Remarks of C. D. Baucom, Superintendent of Weights and Measures, State of North Carolina 99
Paper of Barnett Kanzer, Director, Bureau of Weights and Measures, State of New York 100

Digitized by Google

Page

Report of Committee on Specifications and Tolerances, presented by F. S. Holbrook, chairman, and discussion thereon 103
Section on vehicle tanks 106
Section on scales 115
Section on liquid-measuring devices 123
Promoting contests, by B. W. Ragland, Chief, Bureau of Weights and Measures, city of Richmond, Va 125
Report of Committee on Nominations, presented by O. E. Brenneman, chairman, and election of officers 127
Dimensional method of testing containers for fruits and vegetables, by L. C. Carey, Specialist in Package Standardization, Bureau of Agricultural Economics, United States Department of Agriculture 128
California gasoline and oil substitution act, by C. E. Tucker, Chief, Division of Weights and Measures, State of California 134
Report of Committee on Resolutions, presented by C. L. Klocker, chairman, and adoption of resolutions:
Appreciation to Director and staff of the National Bureau of Standards 136
Appreciation to management of headquarters hotel 136
In memory of deceased members 137
Appreciation to the press and to the Scale Journal 137
Appreciation of cooperation 137
Endorsement of proposed bill to fix the standards of weights and measures of the United States 137
Appreciation to officials cooperating 137
Endorsement of proposed Federal legislation for standardization of packages for canned foodstuffs (H. R. 6964) 137
Endorsement of principle of general standardization of packaged goods 138
Report of the treasurer, George F. Austin, Jr 138

123292—39——2

Digitized by Google

Digitized by Google

REPORT OF THE TWENTY-EIGHTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

HELD AT THE NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C., MAY 31, JUNE 1, 2, AND 3, 1938

FIRST SESSION—MORNING OF TUESDAY, MAY 31, 1938

(The Conference was called to order at 11:00 a. m., by Dr. Lyman J. Briggs, President of the Conference.)

ADDRESS BY LYMAN J. BRIGGS, DIRECTOR, NATIONAL BUREAU OF STANDARDS, AND PRESIDENT, NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

In opening this Twenty-eighth National Conference on Weights and Measures I wish to review briefly some of the things that have taken place during the last year, which I think will be of interest to you.

During the past year our apparatus for testing vehicle scales has been in service in a number of States. I have been gratified by the response on the part of State and municipal officials regarding the visit of this apparatus to various States. We have had throughout your unfailing interest and cooperation. In return, I hope that the equipment has been useful to you in your activities toward the securing of permanent equipment for your own use. During the course of the Conference we will have several reports from various members of the Conference on their success in this regard.

The results of the work have only confirmed what you and we both felt would be the case, namely, that there was a great need for standardizing apparatus in the field of vehicle scales. The results of our work so far have indicated that on the average only about one in five scales is within acceptable tolerances.

The second matter which I wish to bring to your attention is the fact that we hope soon to have here at the National Bureau of Standards a suitable vehicle scale of our own. We have been negotiating for a 60,000-pound scale with a platform 40 feet long, to be installed on Van Ness Street near the powerhouse. That scale will be so installed, we hope, as to constitute a model in this respect and will give us an opportunity to see how well a scale of that kind can be maintained. We hope, also, to supplement this installation with another scale of a capacity of 10,000 pounds, which can be used in the calibration of 1,000-pound and other large weights. At the present time the only scale we have for this purpose is located in our master scale depot at Clearing, Ill.

Last year I presented to the Conference a draft of a proposed bill to fix the standards of weights and measures in the customary system of units. Hearings were held before the Committee on Coinage, Weights, and Measures subsequent to that presentation, and the bill

Digitized by Google

in a somewhat modified form is ready to be presented by that committee to the House.

The following amendment to the bill has been proposed:

"Provided, That nothing in this Act shall be construed to change any constants used in the computation of plane coordinates, elevations, or other map data."

That provision will allow all mapping to be carried on just as it has been in the past, without detracting in any way from the great advantages to be gained from the main provisions of the bill.

THE VIEWPOINT OF INDUSTRY CONCERNED WITH INTERCHANGEABLE MANUFACTURING TOWARD THE PROPOSAL TO STANDARDIZE THE INCH

By HERBERT B. LEWIS, *Brown & Sharpe Manufacturing Co.*

In discussing the subject of legally standardizing the United States inch, we are primarily interested in the House of Representatives bill H. R. 8974. In this bill the first three sections relate to standards of length, sections 4 to 7 relate to standards of mass, and sections 8 and 9 are concerned with volume. Inasmuch as we are discussing length standards, small variations in which do not have an appreciable effect upon volume, and we are not concerned with standards of mass, this discussion will relate only to the first three sections of the bill.

It is interesting to review briefly the background for standards in this country in order that we may appreciate in a greater degree the benefits which may accrue from the passage of such a bill as has been proposed.

Being British Colonies, we naturally used the standards of England until 1776, but upon the adoption of the Constitution of the United States, no change was made and we continued with standards previously used. Although the Constitution delegated to Congress authority to fix standards, Congress has seldom availed itself of the opportunity. In his presidential messages from time to time, Washington urged Congress to act under this constitutional provision, and the matter was repeatedly discussed, but practically no definite action has ever been taken. Various State legislatures have asked Congress for action in the interest of uniformity, without avail.

In 1790, Jefferson, then Secretary of State, proposed a standard of length, based on the length of a uniform cylindrical pendulum, beating seconds at sea level at 45 degrees north latitude, and in 1821, John Quincy Adams, then Secretary of State, urged Congress to fix the standards for this country, consulting with foreign nations and having in mind the future establishment of universal uniformity.

In 1830 the Treasury Department investigated the standards in use in the United States customs houses in the interest of uniformity in collection of customs. At that time Congress directed the Secretary of the Treasury to send a complete set of weights and measures to the Governor of each State, but no congressional action was taken to legalize these standards. However, most of the States adopted them, and they thus became legal standards.

During the period 1840 to 1880, accurate measure and standardization received its first real emphasis, due, in a great measure, to the work of Sir Joseph Whitworth. His work on standardization and interchangeable manufacture was based on gages of the end-measuring

Digitized by Google

type, which he was able to compare with a high degree of accuracy on a measuring machine of his own construction.

Great Britain presented the United States with "Bronze #11" in 1856. This was a standard yard at 61.79° F and was made of the same alloy as the British Imperial Yard, which is approximately 16 parts of copper, 2½ parts of tin, and 1 part of zinc. This was accepted as the standard yard for the United States by the U. S. Office of Weights and Measures and was used as such over a period of several years, although it was never adopted legally.

Congress, in 1866, took definite action relative to standards by passing the act of that year, which made it lawful to employ the metric system in this country. This act included a table of equivalents for converting from the English to the metric system.

In 1893 Mendenhall, who was then in charge of the United States Coast and Geodetic Survey, issued an order which was approved and promulgated by the Secretary of the Treasury. This order reversed the calculation of these equivalents by making the metric standards the base. This reversal of calculations resulted in a variation between the United States and the English length units. This variation was unimportant, except in the case of highly refined measurements.

Therefore, upon the authority of the Secretary of the Treasury, the International Prototype Meter was set up as the fundamental standard, and the yard was derived therefrom in accordance with the act of 1866, the conversion factor—1 meter equals 39.37 inches, exactly, or 1 inch equals 25.400051, approximately—being employed.

Up to this time no serious efforts were being made to provide legalized length standards in this country. This may have been a blessing in disguise since they might have been set up without due regard for the international aspect.

Definite and constructive action was begun when the United States, in collaboration with practically all of the other civilized countries in the world, combined in the formation of the International Bureau of Weights and Measures, the headquarters of which are in France, on territory which has been declared neutral by the French Government. About 50 years ago this Bureau made the International Standard Bar and a number of master bars. One of the master bars has been sent to each signatory nation, and during the period of about 50 years no appreciable changes that could not be accounted for have been noted. Thus, it is seen that there are in existence throughout most of the civilized world, standards of length which are in agreement, the one with the other. In view of the fact that the National Prototype Standards are, from time to time, returned to the International Bureau for recomparison, a comprehensive system is provided by means of which all standards can, either by direct comparison or by computation, be placed on the same basis. It is obvious that this is giving to the world a uniform standard of length and that the proposed bill recognizes this international standard of length as the master to which to refer, and officially confirms the part which the National Bureau of Standards has taken in connection with the International Bureau of Weights and Measures.

Because of the urge occasioned by the rapid growth of interchangeable manufacture, development of highly accurate gages and methods of producing and measuring them came rapidly.

It was recognized by industry that, from the point of view of foreign trade, precision-made products of one country must measure the same

Digitized by Google

in the country of the purchaser, as in the country of origin. In order that such a condition prevail, the base of all measurements must be one standard, and conversions from this must employ identical conversion factors.

Industry in 16 countries, including the United States and Great Britain, has adopted the conversion 1 inch equals 25.4 millimeters and thereby recognized the International Meter. In 1930 the British Standards Institution in Great Britain, and in 1933 the American Standards Association in the United States, adopted this relation. In view of the needs and action of industry in these two countries, it is reasonable to expect that the governments will adopt as legal the standards that have been adopted and in use by industry for a number of years.

The bill under discussion supplies industry in this country with a legal foundation for length measurements that agrees with the rest of the civilized world. Section 1 recognizes the International Meter, and section 2 legalizes the conversion ratio 1 inch equals 25.4 millimeters, which changes the Mendenhall inch of 1893 by about 2 millionths, bringing it into closer agreement with the legal inch of Great Britain. However, it has no effect upon industry whatever since industry of both countries has already adopted and is using it.

Today, industry uses gages, the gaging dimensions of which must be known to the order of millionths of ar inch. The most generally used, and probably the most reliable, means of making such measurements is the interferometer in which case users must know the exact length of the wave of the light used.

In section 3 this bill gives the value of the wave length of red cadmium radiation when determined under certain standard conditions specified by the International Committee of Weights and Measures. By leaving the specifying of conditions in the hands of the International Committee rather than setting forth its own specifications, the United States standards will be kept in international agreement by a group that is enabled to take advantage of developments in methods and equipment by changing standard conditions when benefits are to be gained.

The International Meter has never been officially certified in wave lengths of light, but in 1927, at the request of the National Bureau of Standards, the International Bureau reviewed a considerable number of tests and has established provisionally that the number of wave lengths of red radiation from cadmium in 1 meter is 1,553,164.13. It is felt at our National Bureau that this is a true value and that it can and should be used in defining the meter and the inch. In sections 2 and 3 of the proposed bill this is done, and it is felt that this country is going farther than any other in taking constructive action in furthering the standardization of units of length.

In summing up this discussion, the following appear to be the outstanding advantages that would result from the passage of H. R. 8974 from industry's point of view:

1. It puts our standards of length on a definite, permanent, and legal basis; it also brings them into agreement with those that have been internationally adopted.

2. It supplies an accurate, convenient, permanent, and easily reproducible United States inch.

3. It makes legal a convenient and easily applied relation between inches and millimeters.

Digitized by Google

(a) The conversion ratio has a small number of figures.

(b) It allows a gear ratio of 5 to 127 for metric screw-cutting on our lathes. By that I mean the gear ratio that will enable us to very easily cut metric screws on an American lathe.

4. Defining the inch in wave lengths of light is of great value and convenience in measuring and producing precision gages and parts used in interchangeable manufacture.

5. It legalizes what industry has been forced to adopt in the interest of foreign trade.

In view of the rapid developments in precision measurements during the past few years, there is every reason to believe that they will be carried forward in the future. It will be recalled that it was a comparatively few years ago that we changed our standard temperature from 62° to 68° F, which is universally accepted and used by industry.

This change had the effect of changing a 1-inch gage block approximately 35 millionths of an inch. This change was made easily at that time and caused comparatively no criticism, due, no doubt, to the fact that industry did not employ the highly developed measuring methods of today.

By similar reasoning it is clear that industry can, without serious disturbance, make the much smaller change proposed in H. R. 8974, and that the sooner the change is made the less will be the disturbance and the greater the advance toward definite international standards.

The CHAIRMAN. We are greatly obliged to you, Mr. Lewis, for this presentation of the matter of standardization from the standpoint of industry.

NOT IN THE BOOK

By O. E. BRENNEMAN, *Chief Deputy Sealer, Bureau of Weights and Measures, State of Ohio*

A famous pedagogue who lived long ago was often heard to say—"The place to begin to teach is where the book ends." This pedagogical maxim is applicable to weights and measures officials everywhere and is the theme of this discussion.

The handbooks which are used for guides in the different States are quite comprehensive; they contain the laws and regulations of the State pertaining to weighing and measuring devices, instructions to sealers, and a vast amount of information, but the solution of numerous problems which confront us in an official capacity is not written in any book and cannot be reduced to a formula or code, because each one is different, is often complex, and therefore is interesting.

The first topic to be presented for consideration is the much discussed and ardently wished for uniformity among the several States and among their subdivisions. There is almost unanimous agreement in the desirability of uniformity, and the border line cases which now cause so much perplexity and are so difficult to settle would be largely eliminated were we to have uniformity.

It is strange indeed that a weighing or measuring device which is deemed accurate and acceptable in one State or county should be considered inaccurate or undesirable in another when it operates just the same in either locality. It is possible to have uniform laws and regulations, but it is not probable that we will have them in the very

Digitized by Google

near future. State legislatures are not like machines which all operate on the same drive shaft. Regulations are promulgated by men who have unlike judgments of the relative importance of certain activities. Various sections of the country have different ideas and desires, and the only logical way to secure a reasonable degree of uniformity is by crystallizing sentiment in favor of certain generally needed laws in conferences such as this. The greatest lack of uniformity, however, is not in the laws and regulations but in the administration of the laws and regulations. Most State constitutions provide that a law must be uniform in its application to be constitutional and this is also the legislative intent of all the laws in the general code. However, in the actual administration of the law, it is far from uniform.

The point may be illustrated by citing two officials in adjacent jurisdictions. One is very conscientious and aggressive. He is in favor of a strict observance of the law. No technical or minor infraction is permitted to go unpunished. His condemning tags are much in evidence and his prosecutions numerous. He is a sort of Attila, before whom trembling violators bow the knee. He has a reputation as an active official.

The other official is a diametrically opposite type of man. He is just as conscientious and just as aggressive, but his philosophy of government and his mode of enforcement are different. He feels that if every law is strictly enforced, everyone will be indicted. With this attitude he is inclined to forget the minor and technical violations and is slow to prosecute or condemn.

With a multiplicity of types of service which an official can render, it is very difficult to place an equal emphasis on all his activities at the same time, so one will stress the thing that to him seems most important, and the other one will emphasize something else.

This difference in viewpoint and procedure is illustrated by two letters which were received the same day from two station operators. One complained that the pumps were tested too frequently; the other complained that they were not tested a sufficient number of times. One operated in a jurisdiction under a fee system; the other one did not.

How to secure uniformity of administration in the different counties of the State is not in the book but is a problem which must be solved in meetings of sealers' associations, schools for weights and measures officials, and the free exchange of ideas. One of the English kings said, "If I can not make two clocks run alike, how can I expect to make two men think alike?" A uniformity that takes away individuality and puts every one in a well-defined groove is undesirable, but a uniformity of administration in which the general procedure is similar in each county is highly desirable. A general program set up by the State can usually be carried out by the smaller subdivisions and thus correlate the activities of the group.

In recent months much attention and thought has been given to the size and weight of packages. The packages which give concern are those which, although they are labeled strictly according to law with the exact weight or volume printed on the label, usually in small print, are not of standard size; however, they approximate so closely the weight and size of the package in which the commodity is usually sold that they can readily be mistaken for standard-weight packages. A 15-ounce or a 7½-ounce carton of butter when displayed on a

Digitized by Google

counter is so similar to a 1-pound or ½-pound carton that the customer can easily fail to notice the difference. A paper ice-cream container made to retail at 10 cents is another example.

In one store 15 different sizes of fancy vinegar bottles were displayed on a counter, each one properly labeled. Panel bottles, round, square, and triangular bottles of infinite variety, shape, and size are displayed in colorful array before the customer and out of this conglomeration the housewife makes her purchase. Large cartons and smaller cartons, all containing exactly the same amount of the same commodity, add to the confusion, and the remedy is not in the book.

Some manufactures of cartons have been kind enough to consult the Bureau of Weights and Measures before placing an odd-size carton on the market, and a number of them have expressed a desire to confine the number of cartons they manufacture to a few standard sizes. They reason that they are able to sell a certain number of cartons in a given period of time and that the sale of any one size decreases in almost mathematical proportion to the number of sizes they sell. In the judgment of the writer this subject should be discussed in various interested groups and given publicity until some feasible plan is promoted to standardize packages and containers so that "he who runs may read." This is a problem which calls for the cooperation of manufacturers, retailers, weights and measures officials, and the consuming public.

This brings us to the next goal which is not in any book, and that is how to secure the cooperation of State and county officials, merchants, and the general public in the program. Laws are only enforced in the hearts of the people. A law or a program may not be 100 percent perfect either in theory or in the mechanics of its operation, but if it is popular and a great majority of the persons who are subject to its provisions feel that it has a benign influence on their business or social activities it is almost self-operative. Another law may be theoretically sound and yet be so unpopular that it is almost impossible to administer it.

It would simplify the problem if the solution could be reduced to writing and put in a book, but only suggestions can be made and the real solution must be found in the ingenuity of the local deputy sealer. Cooperation is always born of understanding and mutual interest. It is unfortunate that a deputy sealer is so busy he does not have time to explain his own business. A little visit and a few minutes spent in explaining what it is all about pay big dividends. Why not assume the attitude that manufacturer, dealer, customer, and official are all partners in this business of correct weight and measure? When we take them into our confidence cooperation will flourish like a green bay tree. It is amazing that so important a function of government has received so little publicity.

The catalog of any large public library will contain dozens or scores of books on the different divisions and activities of government and very few, if any, on weights and measures. Current magazines will carry articles of general interest about the work of certain departments and the newspapers are full of human interest events portraying the working relationship between the average citizen and his government. These, too, are usually silent on any subject relating to weights and

Digitized by Google

measures. How can the man on the street or out on the farm be expected to cooperate with something he does not know is in existence and of which he has never heard?

The main objective of the entire program is customer protection. Two factors are involved in securing this protection. One is the construction and accuracy of the mechanical device which is used in the transaction and the other is the integrity of the operator. Mechanical devices can be perfected and certain standards adopted for their construction. If they are constructed according to specifications and are properly installed and accurate, a seal is placed upon them so that the customer may have reasonable confidence in their accuracy.

This is a twice-told tale because it is all in the book, but the book makes no provision for sealing the operator. This is the major problem confronting us in reaching our objective of customer protection. Examples of the misoperation of a weighing or measuring device are much more numerous than those of defective equipment. Visit the marts of trade on a busy day and note the position in which the scales are placed and the manner in which they are operated. Many are within the letter of the law because the book says they must be placed within 3 feet of the customer and nothing shall obstruct the customer's view. Some modern glass show cases are quite high to permit the display of merchandise and when a computing scale is placed on top of the counter it is considerably above the eye level of the clerk and customer. In this position the reading on the dial is always in favor of the seller. In rush hours, commodities will be thrown upon the scale and quickly removed. At the instant the indicator has come to rest the clerk will name the price and lift the commodity from the scale. It would require sharp vision and familiarity with the chart to be able to read the indication in this rapid-fire order. Perhaps this practice is in keeping with the tempo and speed of modern business methods. No inference is intended that speed always means inaccuracy. It does make checking difficult from the customer's angle. Some stores have adopted the policy of calling both the weight and the price to the customer. This seems to be a very good custom. It has been encouraged by those interested in better trade practices and is meeting with public approval.

Human integrity is the only element in business that cannot be measured or relied upon. Persons who have been honest for years will sometimes go wrong—victims of the cross currents of human life. The machine can easily be adjusted or repaired. Adjusting the operator is not always such a simple task. An extended discussion of this important phase of the work would take us far afield into the realms of psychology and religion. Blessed is the weights and measures official who can instill into the minds of those whom he contacts a desire to always give a full measure, an accurate count, and an honest weight. This may sound quite abstract and general, but in our State in the past year we have stressed this very thing, and the results have been gratifying. In one county the sealer talked honesty at meetings; he stressed it in the newspapers; it was the subject of his conversation on the street. Like Cato of old, who went about the streets crying "Carthaga est delenda" until Carthage was destroyed, he really made the citizens of his county weight and measure conscious and that county is noted for its few violations. In this community four dealers sold chickens and turkeys by the piece. Two of

Digitized by Google

them began to sell by weight. They are in business today; the other two have quit business.

No claim is being made that all unethical practices will automatically vanish when a community is made weight and measure conscious. It will always be necessary to resort to the punitive provisions of the law in a few instances but not so frequently. We pay tribute to the honest merchants of America. There are thousands of them and only a few dishonest ones.

Another important phase of the work which cannot be found in the book is the means whereby each subdivision can secure adequate personnel and sufficient equipment to carry out the program in an efficient manner. Many counties are lacking in equipment and have no deputy sealer, or have a deputy who is only a part-time man and receives a very small compensation. This condition seems to be quite general in a majority of the States and it appears that the remedy lies in legislative procedure.

The entire problem is a problem of human relationship. It originated when barter or exchange began among primitive men. Back of each device is the story of the labor and the trials of the man who invented or constructed it. Back of every scale or pump is a human operator and back of every law is a human need for the protection which it affords, so this leads us to the logical conclusion that the rules and regulations are in the book, but the great problem of their specific and local application is not in the book.

ACTIVITIES OF THE NATIONAL SCALE MEN'S ASSOCIATION

By H. O. Hem, *President, National Scale Men's Association*

Mr. President, Conference members and guests, it is an honor to be given a place on your program representing the National Scale Men's Association. This organization is only about 4 years younger than the National Conference on Weights and Measures.

You have established and developed a worth-while institution of which we are all proud—the National Conference on Weights and Measures. I have attended several of your, or may I say, our Conferences, and each year I have felt the time is well spent and profitable. You have endeavored to bring about a uniform and accurate method for testing weighing and measuring instruments, which is a safeguard for the manufacturers and users of the devices as well as the public in general. Now, nearly all realize the necessity of having sealers of weights and measures as well as adequate equipment with which to test scales and measuring devices.

My topic is "Activities of the National Scale Men's Association." I believe most of you have heard and know as much about the activities of the NSMA as I do. You have heard several times before that the NSMA is composed of many men engaged in installing, repairing, and testing scales. Quite a number of the members are manufacturers of weighing equipment, some are shopmen, and a considerable number are sealers of weights and measures.

I might discuss the necessity for a scale men's association. In doing so, first, I would like to tell you something about scales before we had such an association and before we had any specifications for scales. As far as I know we then had no yardstick to measure anything by. We had no information as to what the carrying capacity of

Digitized by Google

a scale must be in order to be rated at a certain capacity, and in fact, no fiber-stress calculations were made on any of the component parts in scales. Many scales were made without any detailed drawings of the component parts; only some meager drawings were furnished for the installation of scales.

In 1880 and 1890, railway tracks scales were sold and installed as of 100-tons capacity; a main lever of such a four-section scale now would not be rated as of 20-tons capacity. The method the manufacturers usually pursued in designing a scale was to make a lever of such a size that it appeared to be sufficiently strong to carry an imaginary specified load. Breakage of levers was a frequent occurrence, but it was attributed to mysterious and unforeseen causes or hidden defects; however, in view of the excessive breakage, the levers were gradually increased in size. Can you imagine a four-section 80-ton railway track scale in which a cast-iron main lever weighed only 96 pounds? Yet, at one time levers of this weight were incorporated.

Most of the scales built had rigid platform bearings or the lever mechanism was suspended so that when the platform was disturbed all of the levers would swing and move, with the result that the knife-edges would get dull rapidly since the knife-edge changing position in the bearing increased the wear. In addition to this, there was an excessive load per lineal inch of knife-edge. In fact the main-lever load pivot in a 100-ton railway track scale was only about 5 inches or 5⅝ inches in length—a load in excess of 10,000 pounds per lineal inch.

Between 1890 and 1900 I was in competition with other manufacturers on an inquiry for a large number of railway track scales. I suggested to the chief engineer of the company that he should not buy scales the way he would buy sugar and coffee. Merely specifying a 100-ton scale was not enough—the load on each main lever should be stated; the fiber stresses in the component parts of the scale should be known. I asked him if he would order a bridge calculated and built in this manner; if not, why should a mysterious scale be bought that way? (The scale was a mysterious mechanism because no one knew anything about it, and anyone who did know about it never told anyone about it.) The chief engineer then sent out requisitions for bids on scales requesting that the bidder submit detailed drawings of the component parts in the scales, and, if they had such information, fiber-stress diagrams for the various parts. I was on the job when the bids were opened and found I was the only one who had such information. The other competitors merely stated they had been in business a great number of years, that they were responsible concerns, and that they would guarantee their scales. The competitors argued against the scale I proposed to furnish, saying it required a pit 2 inches deeper than their scales; I maintained this was a benefit instead of a detriment, as larger angleworms could be employed as inspectors on account of the better chance to get under the scale.

At this time the sealers of weights and measures did not have much equipment for testing scales; only from 100 to 500 pounds of test weights were available with which to make a test of any kind of scale, possibly with the exception of some grain hopper scales.

In the next few years, between 1900 and 1910, considerable improvement was made in scales, especially railway track scales. Heavier scales and weighbridges were built, but even at this time sealers of weights and measures or scale inspectors had no adequate facilities for testing scales.

Digitized by Google

The Pennsylvania Railroad Co. was the first to use test cars for testing railway track scales. Subsequently, several railroads started to use improvised test cars, such as ordinary boxcars loaded with test weights. I know that one large railroad company even considered using a boxcar having a certain amount of test weights in each end in an effort to produce a known weight on each truck to serve as a short-wheel-base test car. The sealers of weights and measures know that the weights could not remain fixed. (Mr. Richard of the National Bureau of Standards will tell you why the method of testing a scale with half of a car or one truck will not work.) Now, you can understand why there is a necessity for the members of the National Scale Men's Association to exchange ideas and write rules and specifications.

The first scalemen to organize met in Minneapolis in 1910. They became known as the Northwestern Association of Scale Experts. C. C. Neale was elected president at this meeting. At the next annual meeting, held in 1911, the name of the organization was changed to the National Association of Scale Experts. In 1913 or 1914 another scalemen's organization, known as the Southern Scale Men's Association, sprang up. In 1916, as I remember, a joint meeting of these organizations was held and it was decided at this time to consolidate and to change the name to the National Scale Men's Association. Since that time meetings have been held each year. The National Scale Men's Association now has approximately 350 members and new members are being added. At the annual meeting held last March, 171 persons were present at the banquet and 300 at the Central Division Host Night.

The Central Branch is located in Chicago and has a membership of about 125, the Pittsburgh Division has a membership of about 30, the Southern Division has a membership of about 33, the Midwestern Division has a membership of about 20; the Northwestern Division, formerly called the Northwestern Scale and Measures Association, held a meeting in March 1938 and voted unanimously to become a local of the National Scale Men's Association.

I have looked over some of the papers given here in previous years by representatives of the National Scale Men's Association, and to refresh your memory, I may say that I found that some of the projects which have been described are as follows: Code of specifications for railway track scales for light industrial service; code of specifications for the overhaul and repair of large-capacity scales; standard test-report form; code of specifications for railway track-scale test-weight cars; code of specifications for motortruck scales; code for adequate test of motortruck or wagon scales (tentative); adequacy of material and process for scale pivots and bearings.

Briefly, the most important current projects are: Two-draft weighing on vehicle scales, motortruck scale-testing practice, and glossary of scale terms.

In relation to the last-mentioned project I wish to tell you that M. J. J. Harrison has a glossary of scale terms which he has compiled, and he has with him some copies for distribution. Mr. Harrison has provided a memorandum explaining the history of this project, as follows:

Earliest available records show a committee working on the matter in 1920—the committee consisting of C. A. Briggs (then of the staff of the National Bureau of Standards, more recently of the U. S. Department of Agriculture), C. J. Scrib-

Digitized by Google

ner (then of the Engineering Department of the C. B. & Q. R. R., now deceased), and J. A. Schmitz (of the Chicago Board of Trade). This committee of the NSMA actually took certain preliminary material which had been originated in the American Railroad Association (one of the predecessor organizations of the Association of American Railroads) about 1913 or 1914.

Because of a variety of circumstances, progress of the matter in the NSMA was for several years rather desultory, and it was not until 1936 that any great amount of publicity was given the matter. At that time, a list of some 141 definitions was presented to the Twentieth Annual Convention of the NSMA and published in the March 1936 issue of the Scale Journal. Following this publication, the NSMA editorial committee undertook an expansion of the list of definitions, and a succession of drafts was prepared, each more complete and detailed than its predecessors. By the time the next annual convention of the Association was held (in 1937), the number of definitions had increased to something like 640 or 650, and this material was distributed to the membership of the Association and a few other interested parties in mimeographed form.

In the meantime, the Association's editorial committee kept on with its work, and submitted at the 1938 convention still another draft, comprising some 890 definitions. Distribution of this material in March 1938, created so much interest that, when the NSMA was invited to make copies of its glossary available to the National Conference on Weights and Measures, the number of definitions had increased to approximately 1,210. These definitions are included in what has been designated as the "11th Draft", dated May 31, 1938, and consisting of 74 mimeographed pages.

The object in bringing this material to the attention of the National Conference on Weights and Measures is twofold. In the first place, the material is offered as information, and attention is called to the fact that it is fully realized that the definitions are still "tentative." In the second place, the assistance of the National Conference on Weights and Measures in making the document more nearly complete and correct is sincerely asked. Members of the Conference are requested to scan the glossary for omission of terms and meanings, and are invited to submit suggestions for additional terms and meanings to the NSMA. It will be appreciated if such suggestions can be sent direct to M. J. J. Harrison, Supervisor of Scales and Weighing, Pennsylvania Railroad Co., Altoona, Pa.

Copies of the "11th Draft" will be found at the Conference registration desk at the close of the current session and thereafter, and are, of course, free to the members of the Conference.

The National Scale Men's Association at the last meeting, raised considerable objection to the 0.4 of 1 percent tolerance for corner tests on motortruck scales and a committee met here a day or two ago with the Committee on Specifications and Tolerances of this Conference with a view to modifying the tolerance which was adopted here last year.

From the above I think you may conclude that the National Scale Men's Association is a worth-while organization. The various local groups are also doing much good in discussing problems which confront scalemen in all branches of scale work. Perhaps we are not getting along as fast as we should, because all the members and committees have different ideas and much of the same feeling toward each other as that which prevailed when Robert Owen said to William Allen in 1828 when they severed partnership, "All the world is queer, save thee and me, and even thou art a little queer." That is why it takes so much time to accomplish so little. Specifications for scales will never be finished. Conditions change too frequently, and new developments require new specifications. So we are here to stay.

The CHAIRMAN. You will recall that the subject of the labeling of incandescent filament lamps was up for a brief discussion last year, and it was indicated that the Conference desires more information on the possibility of labeling lamps, not only as to the power used but also as to the light emitted. Dr. Meyer of the Electrical Division of the Bureau will therefore discuss this subject.

Digitized by Google

LABELING OF INCANDESCENT-FILAMENT LAMPS

By J. Franklin Meyer, *National Bureau of Standards*

An incandescent-filament lamp, for the purpose of this discussion, is an electric lamp in which the filament is heated to incandescence by the passage of an electric current. The filament is surrounded by a glass container which may be evacuated or which may be filled with an inert gas. The independent variable in the use of a lamp is the applied voltage and ordinarily lamps are designed to be operated on 110, 115, or 120 volts. Lamps are, however, obtainable for operation at 125 and 130 volts, and for certain purposes 220-, 230-, 240-, and 250-volt lamps are generally available. Lamps for low voltage purposes, that is, for train lighting, for "country-home" lighting, and for automobile and flashlight service are also made in very large quantities.

With a definitely applied voltage, let us say 115 volts, a lamp designed by the manufacturer to be operated at 115 volts takes a certain current, which when multiplied by the voltage, gives the wattage of the lamp; it produces a certain amount of light at a predetermined efficiency in lumens per watt, maintains its initial light output within a predetermined minimum percentage, and has an average life which is determined by conditions of use. The life of lamps ranges from a very short time to several thousand hours.

The problem before us today is how such a device should be labeled. It is now labeled volts and watts. The proposal to be discussed is whether the labeling should be as is now the custom, that is, volts and watts, or whether it should be labeled in volts and lumens; or volts, watts, and lumens; or volts, watts, and lumens per watt; or volts, watts, lumens, and life.

When incandescent-filament lamps first came on the market, and for about 25 years thereafter, lamps were labeled in volts and candlepower. Some of us recall the days when the label on an incandescent-filament lamp read, for example, 110 volts 16 candlepower. Soon after tungsten filament lamps came on the market, and it was found possible to manufacture lamps ranging in watts from 10 to 500 or more, manufacturers generally abandoned the labeling of lamps in volts and candlepower and began the system of labeling incandescent-filament lamps in volts and watts. During the last 25 years, continual improvements have been possible in the manufacture of tungsten-filament incandescent lamps and, for example, 60-watt lamps have changed in lumen output from 720 lumens in 1930 to 822 lumens in 1938, or in lumens per watt from 12.0 to 13.7.

Each year the manufacturers of lamps who have contracts with the Federal Government meet with members of the Procurement Division of the U. S. Treasury Department and engineers of the National Bureau of Standards, and a yearly supplement to the Federal specification for large tungsten-filament incandescent lamps is agreed upon. Practically each year increased lumens and lumens per watt are agreed upon in every size lamp in watts from 15, at the present time, to 1,500. Sometimes, as has been the case in the last year, two such changes are made in one contract period of 1 year, and very recently, on account of the introduction of the coiled-coil filament lamp of 50- and 60-watt sizes, changes of as much as 10 percent have been made at one time. Although the Federal specification for incandescent lamps is applicable only to Federal purchases of lamps, it, in effect, sets the standard for incandescent lamp manufacture in the United States.

Digitized by Google

In discussing lamps and lighting it is a platitude to say that lamps are purchased for the light they emit. Under the present system of marking lamps according to their volts and watts the purchaser buys a 40-watt lamp or a 60-watt lamp because he thinks he knows by experience that a 40-watt lamp or a 60-watt lamp, as the case may be, gives him approximately the amount of light he desires. He forgets or is not aware that in the period of the last 8 years the amount of light he receives from a 60-watt lamp has been increased from 720 lumens to 822 lumens, or approximately 14 percent.

Everyone interested in educating the consuming public relative to economy of lighting stresses the fact that on an average it costs about 10 times more for the energy to burn a lamp throughout its life than for the lamp itself, or in other words, it costs 10 times as much to get light out of a lamp as it does to purchase the lamp. Therefore, what the lamp user gets in light output for the money he pays for the energy to burn a lamp, which amounts to about 90 percent of his lighting bill, should receive his primary consideration. Under the present system of labeling lamps, however, no information is given to the purchaser of lamps to enable him to determine, if he so desires, how much light he is getting for what he spends for the energy to burn the lamps he buys.

Of course, this situation would be corrected by labeling lamps not only as to watts and volts, as at present, but also as to either lumens or lumens per watt, or both. The lumens-per-watt labeling would give the better description of the quality of lamps. Lamps might also be labeled as to average hours of life. The benefit to the consumer from such labeling of lamps appears obvious. However, there is one obvious disadvantage to such labeling of lamps. The quality of lamps is continually rising. This rise in quality results in periodic increases, and sometimes abrupt increases, in the lumens-per-watt rating of the lamps. When a lamp dealer replenishes his stock of any size of lamp, he would then, in general, have in stock lamps of different lumens-per-watt ratings. Also, different dealers, even of the same brand of lamps, would have lamps of a given size in lumens of different lumens-per-watt ratings. Would not this result in obsolescence of the lamps every time a rise in efficiency of light output is effected? If so, the cost of lamps might be forced up not only because the obsolete lamps would have to be discarded but also because of the expense of almost continually having return shipments of old lamps from the dealer to the manufacturer.

In the labeling of lamps, the question of tolerances on the labeled rating of the lamps must be considered. At present, lamps are labeled as to wattage and voltage. At labeled volts, the watts consumed by lamps, in general, do not exactly equal the labeled watts. Federal Specification W–L–101C and 1938 supplement A thereto, for example, allows a tolerance of plus or minus 3 percent in the watts consumed by most sizes of lamps for general lighting service. The tolerances in the Federal specification, however, are applicable only to Federal purchases and not to lamps on the open market. If this situation remains unchanged, labeling lamps as to lumen output would be deceptive because a manufacturer who deliberately allowed his lamps to consume more than the necessary watts could truthfully label his lamps with a high lumen rating. Besides, no tolerances on lumens are given in the Federal specification. The manufacturer is entirely unrestricted in his continuous efforts to give the purchaser

Digitized by Google

more lumens of light from a fixed number of watts. But even if lumen tolerances were available the lumen rating of lamps could be raised by taking advantage of the plus tolerance in watts. To obviate that difficulty the Federal specification applies a plus or minus tolerance to the lumens-per-watt declared rating of lamps. It further specifies that the rated hours of life of lamps apply to operation at rated lumens per watt. The labeling of lamps in lumens and hours life seems to require at the same time tolerances on the lumens per watt at rated volts and on the hours life at labeled lumens per watt.

The intrinsic value of an incandescent-filament lamp depends on four factors: (1) the initial wattage input, (2) the initial light output, (3) the maintenance of the light output throughout life, and (4) the life to failure. Only when all of these factors are known do we have a true basis for evaluation. These four items are specified in the Federal specification for incandescent lamps.

As just stated, lamps can be made to produce the correct lumen output merely by increasing the watts input. They likewise can be made to meet a requirement which includes both initial wattage input and light output by sacrificing the life. Also, lamps which will comply with the initial efficiency and life requirements but on which the maintenance of light output during life is very poor can be made by the use of what is known in the lamp industry as "sagging" wire.

The efficiency of incandescent lamps is continually improving, it being the exception rather than the rule when any size of lamp in watts does not have its efficiency improved during each current year. These continual efficiency improvements, although of minor significance when expressed in percentage, assume large proportions when expressed in cost of light. For example, on a lamp which consumes $3 worth of current during its life (which would be the case with the 60-watt lamp at 5 cents per kilowatt hour), a 1 percent improvement in efficiency is the equivalent of an additional 3 cents worth of light at no increase in cost.

The markings on lamps would, therefore, be subject to a continual revision in order to be effective from the standpoint of customer protection, or, on the other hand, if the lumen output were to be kept constant, the watts input must be continually decreased.

To mark all of the essential data for lamp evaluation on the lamp, particularly in view of the need for frequent revision, would probably tend to create confusion in the minds of the ordinary consumer. Large purchasers already have these data, either from the manufacturers' data books or by ascertaining what is considered a minimum acceptable standard by reference to Federal specifications.

Assuming that all pertinent data were marked on the lamp itself, the problem of insuring that lamps complied with such markings would be quite complicated. There are relatively few laboratories in this country which have the facilities and experience which permit accurate determinations of the lumen output of lamps. It would seem that the local or State supervision, such as is exercised by weights and measures officials, would be impractical.

If the marking is confined to only one element in lamp value, in addition to design volts, wattage input seems the most logical. Irrespective of what the consumer may receive in the way of light he can determine rather easily the watts input and the cost of operation.

123292—39——3

Digitized by Google

Conformity to wattage rating can be checked by many laboratories throughout the country.

The lamp industry in Europe, except in Germany and Great Britain, marks lamps in the sizes to supply a given lumen output or, as they prefer to express it, a given decalumen output. The lamps are of different performance characteristics from those of the lamps which are made for a given wattage consumption. For example, a 40-decalumen lamp designed for a 115-volt circuit consumes about 34 watts, if it is made in the latest coiled-coil construction. A 40-decalumen lamp designed for 220 volts consumes about 38 watts, if it is also in the latest coiled-coil filament construction.

The practice of making lamps for a given light output and letting the wattage vary according to the voltage for which they are designed is officially adopted in most European countries, and there is a tendency to go over to this practice more and more. These lamps are marked not only with the values in decalumen output for which they are designed but also in the equivalent wattage values.

Thus a consumer who prefers, for some reason or other, a single-coil-construction lamp can see from the values marked on it just how much extra energy he must pay for in order to have the characteristics of the single-coil construction, or a man who prefers to have an opal-bulb lamp may also know from the mark on the lamp just how much extra energy it requires to give the rated light output of the opal lamp as compared with the ordinary inside-frosted lamp.

The watt rating system is still in force in both Great Britain and in Germany, which are the two largest producers and greatest consumers of electric lamps. There is said to be a tendency toward the adoption of the decalumen rating system in Germany. In England there is no tendency in this direction. The British manufacturers and those parts of the industry which have studied the question are unanimously in favor of continuing the watt-rating system without any secondary equivalent marking. The situation in Germany, however, is that the manufacturers and the industries are in favor of the decalumen rating system and will probably adopt this when the new candle is adopted. The Hefner light unit is still in use in Germany. If lamps were rated in Hefner decalumens for Germany and in international decalumens in other countries of Europe, there would of course be a difference in the sizes, that is the decalumen rating, of the lamps. The German industry therefore has preferred to continue to use the watt-rating system up to the present time and will probably continue to use it up to the time when the new unit of light is officially in use all over the world, which it is anticipated will be the fact on and from January 1, 1940.

It is my understanding that in South American countries lamps are generally required by law to be rated in volts, watts, and lumens. In Brazil, for example, a 40-watt lamp will have three lumen ratings, depending on whether it is a 110-, a 120-, or a 130-volt lamp. As there seem to be no tolerances, the ratings must be largely a matter of guess, and it is difficult to see how they can be checked or the lamps evaluated.

The following arguments have been advanced for and against the present ratings in volts and watts.

The arguments for the present system, that is, volts and watts, are:

1. People are used to it and dislike changes.
2. The rating gives the user definite information as to the cost of operation of a lamp.

Digitized by Google

3. The watts are approximately constant throughout life.
4. Opal and colored lamps have the same ratings as clear lamps.
5. The better lamp gives the larger amount of light and has the longer life.
6. Watts are the logical unit in which to rate lamps, as the consumer pays for watts times hours.
7. Lumens and decalumens are new terms. Consumers are familiar with watts and with candlepower (in automobile lamps).
8. Lumens do not mean anything to the average user of lamps.
9. The user can check the watts or have it done. He cannot check lumens nor have it done except at a very few laboratories.
10. Lighting circuits can readily be designed if the watt ratings are known. Lumen ratings are useless in designing circuits. All rules of the National Electrical Safety Code are in amperes and volts, not in lumens.
11. The central station is guaranteed a fixed minimum load no matter how efficient lamps may become.
12. The central station load will not be decreased every time an improvement is made in lamps.
13. The customer benefits from increases in efficiency, because he gets more light for the same outlay.

The arguments for the lumen rating system are:

1. It seems logical to rate lamps for the light they produce.
2. It does not seem fair not to give the customer the benefit of reduced watts, when the light output is increased. He should have the same light output and lower energy consumption.
3. Spotty lighting results when lamps of different lumen output are used in the same room or factory.
4. The date of purchase of lamps would not be a matter of importance, because lamps would always have the same lumen output.
5. There is no definite relation between watts and lumens in different sizes.
6. It is easier for the maker of poor quality lamps to sell his product if rated in watts.

(At the conclusion of this paper, Dr. Meyer showed a number of lantern slides illustrating characteristics and properties of incandescent lamps, methods of labeling, progressive increases in efficiency, apparatus used in testing, and other matters of interest.)

DEMONSTRATION OF FUEL-OIL METER-TESTING EQUIPMENT OF THE CITY OF NEW YORK

By Alex Pisciotta, *Director, Bureau of Weights and Measures, City of New York*

Mr. Chairman and gentlemen of the Conference: With the enormous increase in the consumption of fuel oil, consumers have asked us what protection we can afford them in this connection.

Up to the early part of this year, so far as fuel oil is concerned, we were able to give no protection at all to the public. We made no attempt to check fuel-oil meters or fuel-oil tanks. However, we finally secured a 50-gallon calibrating tank with which we started the checking of meters. Then we thought that instead of using this tank we would use the same equipment as the fuel-oil trucks use in making deliveries. So we procured a meter with an air eliminator and mounted it in a coupé; later we secured a second coupé with a

Digitized by Google

second unit of this kind, so that we now have three equipments. We are able to get around throughout the city faster and to make the necessary tests.

In checking a delivery we get as near to the point of delivery to the consumer as possible. The hose from the tank wagon goes to our meter and the oil is first pumped through this and then goes direct to the consumer's tank. At the end of the delivery we check the meter on the tank wagon against our meter.

Of course, there is a great deal of doubt in the minds of many people as to whether or not these meters are accurate enough and whether or not they supply evidence adequate to justify a prosecution in court when a shortage is found. So we proceed in this way: We calibrate our meters, if not every day at least every other day, with our 50-gallon tank. When we find a tank-wagon meter that is short when compared with our meter, we send the gas trailer to recheck the tank-wagon meter. If the latter is again found short—and we have found that in most instances the two tests correspond—then we are definitely assured that that meter is not correct.

Now, we have found to our satisfaction and perhaps to the satisfaction of the consumers, that the majority of the meters were delivering overmeasure rather than short measure. We have found very few shortages to date. As a result of our tests the companies have been more or less "meter conscious," and of their own volition they have been rechecking their meters. Thus the consumer has been given protection not only by the actual tests that we have made but by the increase in the number of tests of their facilities made by the companies. We have received wonderful cooperation from the fuel-oil people themselves and have many requests to check up their equipment, particularly the meters in their plants. We have done as much of this work as possible.

In New York City we have many independent dealers of fuel oil who have no plants of their own. They purchase the oil from regular oil companies and then they resell the oil. We found that most of those people lacked facilities to check their meters and they have called upon us to do so.

The equipment which we have brought down and will demonstrate is one of the meters mounted on a coupé; attached to that is our 50-gallon calibrating tank. We have been supplied with a tank loaded with No. 2 fuel oil to facilitate our demonstration, and we will try to answer as many questions as we possibly can.

We want you to realize that this is more or less of an experiment on our part, but we think that it is a step forward for the protection of the consumer.

The CHAIRMAN. The meeting will now proceed to witness the demonstration.

(At this point, at 12:48 p. m., the Conference witnessed the demonstration of the fuel-oil meter-testing equipment of the city of New York, and then took a recess until 2:20 p. m.)

Digitized by Google

Portable Equipment Used by the City of New York for Testing Fuel-Oil Meters

NBS Miscellaneous Publication M161



FIGURE 1.—*50-gallon standard measure.*

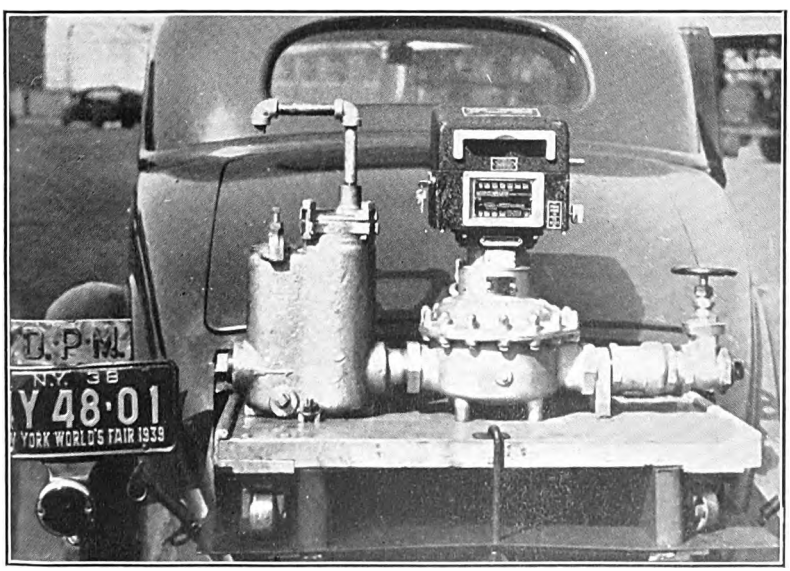


FIGURE 2.—*Meter standard and air eliminator.*

Digitized by Google

Digitized by Google

SECOND SESSION—AFTERNOON OF TUESDAY, MAY 31, 1938

(The Conference reassembled at 2:20 p. m., at the National Bureau of Standards, Dr. Lyman J. Briggs, President of the Conference, in the chair.)

ANNOUNCEMENT OF SPECIAL COMMITTEE

The CHAIRMAN. I wish to announce the names of the delegates who will serve on the Committee on Proposed Federal Legislation to Provide Assistance for the States in Administration of Weights and Measures Laws. The Conference will recall that this matter was under discussion at our meeting last year. Some time ago the Executive Committee voted that a committee be appointed for the consideration of this matter. The Committee will report back at the session on Thursday morning. The members of the Committee are as follows:

John P. McBride, Massachusetts, chairman.
Frank L. Hammon, Idaho.
Rollin E. Meek, Indiana.
J. H. Meek, Virginia.
Charles C. Read, New Jersey.
S. T. Griffith, Baltimore, Md.
W. P. Reed, Atlanta, Ga.

Other committees will be announced later.

DEMONSTRATION OF RECENT DEVELOPMENTS IN WEIGHING AND MEASURING APPARATUS, BY REPRESENTATIVES OF MANUFACTURERS

SECRETARY'S NOTE.—At this point several manufacturers brought before the Conference samples of apparatus embodying new design features and demonstrated them to those in attendance. Particular attention was given to the new features incorporated, the method of manipulation of the adjustments provided, and the answering of questions asked by members. As was the experience in former cases, it was found that many of the remarks made are of no value to a reader when a sample of the product is not before him and thus no good purpose would be subserved in printing such material here. Consequently, it has been omitted from the report.

It may be noted that such demonstrations as these, which familiarize the delegates with new apparatus, are of great interest and value to them. Attendance at the Conference is the only way in which advantage can be obtained from program features such as this. The delegates were duly appreciative of the efforts of the manufacturers who took part in this demonstration.

NEW VEHICLE-SCALE TESTING EQUIPMENT OF IDAHO

By FRANK L. HAMMON, *Director, Bureau of Weights and Measures, State of Idaho*

Mr. President and members of the Conference: It is really a pleasure to be in attendance at this, the Twenty-eighth National Conference on Weights and Measures, and I feel highly honored in having the privilege of presenting to you in technicolor a picture of our new large-capacity scale-testing equipment.

Idaho is known and recognized throughout the Nation as a great agricultural State, the foundation of which is 45,113 farms, cultivating

Digitized by Google

53,346,560 acres of land, mostly irrigated. Hence, the necessity for this large-capacity scale-testing equipment. This unit weighs approximately 21,000 pounds, with our baggage and a tank full of gasoline. The total test load available consists of thirteen 500-pound weights, three 1,000-pound weights, and ten 50-pound weights. The total cost of this equipment was $4,400. We were able to hold the cost down considerably by doing some of the lathe and forging work ourselves.

The truck has a 178-inch wheel base and is equipped with a specially built body and power winch of our own design, which differs in certain essential respects from any other equipment with which I am familiar. You will note from the picture that the truck is fully enclosed, giving adequate protection to our test weights under all kinds of weather and road conditions. You will observe also that our load is compact and equally distributed on the axles of the truck, with 90 percent of our pay load in front of the rear axle, giving the equipment excellent balance for road work.

The floor is covered with ¼-inch rubber belting, which efficiently prohibits slippage of our weights while in transit. The three rows of weights are held in alignment, while loading, by means of wooden guide rails. At the rear of the body floor a drop-leaf door of ¼-inch black sheet steel, 30 by 60 inches, allows the weights to be hoisted and lowered without projecting beyond the truck body. When the door is latched in traveling position, our dolly car is carried underneath it, with the tongue forward, the wheels serving as a door brace at the bottom of the rear body doors.

After testing some 500 large-capacity scales with this equipment, ranging in capacity from the 5-ton wagon scale to the 40-ton motortruck scale, we found that more than 30 percent of them did not weigh accurately in the commodity range. With our old equipment of 4,000 pounds, we were seldom able to test a scale beyond the weight of the empty vehicle used to convey the various commodities to market. We found that more than 50 percent of the wagon-type scales were faulty when used beyond their rated capacity for motortruck weighing (I mean, of course, motortruck loads). The owners of the various scales tested are more than pleased with our new equipment and are beginning to realize that a test load under 10,000 pounds is not sufficient to guarantee accuracy. The maintenance cost of this equipment, including fuel and oil for the motor while operating the hoist during our test operation, is approximately 10 cents per mile. I think this very reasonable when we take into consideration the weight of this equipment. Although Idaho is a small State in population, it is large in area, and it is not an uncommon thing for us to travel several hundred miles in the course of a week's work, and on several occasions we have traveled as far as 300 miles in a single day with this equipment.

The method pursued in testing a large-capacity scale by our Department is the same as outlined by the National Bureau of Standards in last year's conference report (page 128). In making a large-capacity scale test the errors are determined by means of small weights on the platform and not by the use of the fractional poises, except where the fractional poise is being tested. The scale is balanced at zero or starting load with a sufficient number of small test weights on the scale platform to exceed any errors likely to develop in the test, as, for instance, by placing 25 pounds of assorted small weights on the

Digitized by Google

platform. The balance of the beam is then carefully adjusted with the aid of the balance ball until an exact center balance is secured. The test load is then applied, as for instance, 1,000 pounds, the poise being set so that the reading is 1,000 pounds. The beam is then brought to a perfect center balance by adding to or taking from the small weights on the scale platform. From this change in the small weights on the platform, the error in the scale is accurately determined. The sensibility reciprocal of the scale during our test is determined by the same method.

In conclusion, may I state that as my picture is being presented, I will make the necessary explanations, and invite you to enter into any criticisms or discussions. This picture does not cover all of the details of a large-capacity scale test as conducted by our Department. However, it is sufficient to give you an idea as to how the test is made and how our equipment is operated.

(At this point Mr. Hammon displayed a motion picture of a test of a vehicle scale with the large-capacity scale-testing equipment described above. See figures 12 and 13, facing page 97, for illustrations of this equipment.)

PARKING METERS

By H. W. Bearce, *National Bureau of Standards*

In the appropriation Act for the District of Columbia, for the fiscal year 1939, there is a section under which the Commissioners are authorized to install parking meters. Section 11 of the Act reads as follows:

> The Commissioners of the District of Columbia are hereby authorized and empowered, in their discretion, to secure and to install experimentally, at no expense to the said District, mechanical parking meters or devices on the streets, avenues, roads, highways, and other public spaces in the District of Columbia under the jurisdiction and control of said Commissioners, such installations to be limited to a linear footage not to exceed the total of the perimeters of four normally sized squares in such District; the said Commissioners are authorized and empowered to make and enforce rules and regulations for the control of the parking of vehicles on such streets, avenues, roads, highways, and other public spaces, and as an aid to such regulation and control of the parking of vehicles the Commissioners may prescribe fees for the privilege of parking vehicles where said meters or devices are installed.
>
> The Commissioners are further authorized and empowered to pay the purchase price and cost of installation of the said meters or devices from the fees collected, which are hereby appropriated for such purpose, for the fiscal years 1938 and 1939, and thereafter such meters or devices shall become the property of said District, and all fees collected shall be paid to the collector of taxes for deposit in the Treasury of the United States to the credit of the revenues of said District.
>
> Approved, April 4, 1938.

The selection, installation, and supervision of the parking meters above provided for will be under the direction of the Department of Vehicles and Traffic of the District Government, and that Department has requested the National Bureau of Standards to assist in the preliminary test and in the preparation of specifications.

Before going into the technical details and requirements of parking meters it might be well to consider briefly the advantages that may be claimed or reasonably expected to result from the installation of such meters. Obviously, the installation of parking meters will not provide any additional parking space on the streets. The use of meters may, however, tend toward a more efficient and equitable use

Digitized by Google

of the space available for parking, by discouraging overtime parking, and may serve as an additional source of revenue. These would seem to be the principal advantages. Whether or not these advantages, and any others that may exist, are sufficient to warrant the installation of parking meters, I am not in position to say. Offhand, parking meters would seem to be an advantage to the driver who observes established parking time limits and a disadvantage, or at least an inconvenience, to the driver who habitually disregards such parking time limits.

Objection is sometimes raised to the use of parking meters on the ground that there is grave danger of undue influence, fraud, and corruption in the selection of the type or make of meter to be installed. The National Bureau of Standards is in no way concerned with that aspect of the matter. We are concerned only with the features of design, construction, and operation of the meters themselves. The matter of selection must, as in other similar cases, be governed by the intelligence, experience, and integrity of those officials who are charged with that responsibility. Parking meters do not constitute an isolated case. Water meters, traffic lights, and traffic signs, to mention only a few items, must be purchased by the city government.

Turning now to the parking meters which are before you, it will be seen that they are, essentially, timing devices, supplemented by some sort of signal, or flag, which operates to indicate when the predetermined parking time has expired. They can, of course, be set by the authorities to give any desired parking times, for example, 30 minutes, 1 hour, 2 hours, etc.

The procedure in the use of parking meters is as follows: The driver who wishes to park drives his car into the designated space opposite one of these meters—if he is fortunate enough to find a space that is unoccupied—deposits a nickel in the coin slot, and turns the handle if the machine is manually operated. This sets the meter in operation. The time scale then indicates that he is entitled to park for 30 minutes, 1 hour, or for such time as has been fixed by the traffic department for that particular area. He then goes away about his business, hoping he will be able to get back before the time is up. If he does get back in time, all is well. If he does not, then the signal will show red, and he will be subject to penalty for overtime parking.

It will be easy for a traffic officer to observe the meter signals as he passes along the street or sidewalk, and to "tag" any cars that are parked overtime. This will tend to discourage overtime parking in restricted zones and thus will make for more equitable use of parking space.

If a parker uses only a part of the time for which he has paid, a second car may, at the option of the driver, use the remaining time without additional payment, or he may deposit his coin and thus be assured of the full parking time allowed. In the first case the city does not lose anything, since it has been paid for the full time. In the second case, it makes an extra profit, since a part of the time has been paid for twice.

A question as to the possible use of "slugs" instead of nickels has probably occurred to you. That possibility is pretty well guarded against by the fact that each coin or slug deposited in the meter is clearly visible in the coin window until the next coin or slug is deposited in the meter. It is not likely that many slugs will be used, in view

Digitized by Google

of the danger of detection and arrest for attempted fraud or false pretenses in obtaining service.

We cannot say at this time which of the meters submitted will be found most satisfactory in service as extensive service tests have not yet been carried out. We can, however, mention certain features or characteristics which should be given consideration in judging the relative merits of the several meters submitted. Among these the following should be included:

1. Accuracy of timing mechanism at all temperatures of use.
2. Dependability—freedom from breakdown or failure.
3. Ruggedness.
4. Protection against bad weather (rain, snow, sleet, and ice).
5. Visibility of indicating signal.
6. Ease of reading.
7. Ease of operation.
8. Adjustability for any desired time interval.
9. Accessibility for servicing.
10. Security—protection against tampering.
11. Material.
12. Workmanship.
13. Design and general appearance.

Of the meters submitted all except one are operated by some sort of conventional clock mechanism. The one exception operates on the hourglass or "water-clock" principle, that is, the time of flow of a quantity of liquid through an orifice.

Some have automatic coin counters, others have not. Whether coin counters are a desirable feature, or an unnecessary complication, is open to question. It may be noted that pay telephones usually do not have coin counters.

Some meters are mechanically wound by the operation of putting the meter into condition to register. Others are wound separately by the service man or by the coin collector. In the latter type all that the parker has to do is to drop in his nickel.

There is a wide variation in the apparent quality of the clock mechanisms. Some have the appearance of having been well designed and well built; others have more the appearance of the usual 69-cent alarm clock. However, from anything we know now, the alarm-clock type may serve the purpose as satisfactorily as the more expensive type. This can be determined by a suitable service test.

In a rather brief preliminary paper, such as this one, it is, of course, impracticable to include detailed specifications for parking meters. I should like, however, to mention, in terms familiar to every weights and measures man, two provisions which should be included in any specifications that may be written to cover parking meters:

1. All parking meters shall be of such design, construction, and materials that they may reasonably be expected to withstand ordinary usage without impairment of the accuracy of their measurement or the correct functioning of their operating or indicating parts.

2. All parking meters and all devices designed to be attached thereto and used in connection therewith shall be of such design and construction that they do not facilitate the perpetration of fraud.

One question which seems certain to arise, and which in fact has no doubt already arisen in some jurisdictions, is that concerning the

Digitized by Google

department in which the supervision and test of parking meters properly fall, as, for example, between the traffic department and the department of weights and measures. Do parking meters constitute a traffic problem, or are they measuring instruments that should be handled by the department of weights and measures? So far, as I stated in the beginning, the initiative, in the District of Columbia, has been taken by the traffic department. It is probable, however, that in some other jurisdiction the matter might be turned over to the department of weights and measures.

From what I have said it will be apparent that parking meters are a relatively new product so far as the National Bureau of Standards is concerned, and that we are not yet in position to specify in detail what constitutes a satisfactory meter.

The increasing use of parking meters in congested areas of cities throughout the country seemed to the Bureau to justify bringing the matter to the attention of the Conference. Any experience that any of you gentlemen may have had with parking meters will, I am sure, be of interest to the Conference.

In closing, I would like to give you just a few statistics and some conclusions in regard to parking meters. Parking meters are, of course, a rather new development, the first meters having been installed in Oklahoma City, Okla., in July 1935.

The use of parking meters has increased tremendously since that time, and there are now in use some 30,000 meters in the United States in cities ranging in population from about 20,000 to 300,000. Parking meters are little used in cities of less than 20,000 population, and in cities of that size there appears to be need for only a comparatively small number of meters.

An excellent summary of the parking-meter situation is contained in report No. 1892, which is based on data gathered by the New York State Bureau of Municipal Information. The report is dated March 25, 1938.

The report shows seven makes of meters in rather wide use. All seven are represented in the group before you. The prices range from $33 to $65 per meter, installed, with an average price of about $48. The most popular make costs about $58, installed.

The report referred to gives some interesting figures on cash receipts from parking meters. These run, usually, from 30 to 50 cents per meter per day. In the smaller towns the tendency is for receipts to run low, and in the larger towns, to run high.

A study of the report shows that there is a wide variation in the relation between population and number of meters installed. When expressed in terms of meters per 20,000 population the number is found to run from a minimum of 23 to a maximum of 490. The average for all cities of which I have record is 136 meters per 20,000 population. In a few cases it is probable that an excessive, or at least an unnecessary, number of meters have been installed, and in some cases the number has been reduced as a result of experience.

Comments contained in the report indicate that while, in general, the installation and use of parking meters is looked upon favorably by motorists, merchants, and traffic officials, this attitude is not universal. In some cases there has been considerable opposition, and in a few cases meters have been removed, as a result of continued opposition.

Digitized by Google

There are many interesting questions and answers contained in the report to which I have referred, but I shall not have time to take these up in detail. I will mention a few, however.

Question. Do parking meters reduce cruising of cars?
Answer. Yes, materially, 25 to 90 percent.
Question. Do meters speed up traffic?
Answer. Yes, noticeably.
Question. Do more cars find parking space?
Answer. Yes, 10 percent more; 100 percent more; four or five times as many.
Question. Is double parking time allowed for 2 coins?
Answer. Usually no; a few, yes.
Question. May unexpired time be used?
Answer. Yes, in nearly all cases.
Question. How many use unexpired time?
Answer. 10 to 80 percent; no record in many cases.
Question. How much time is allowed before penalty for overtime?
Answer. None; 5 minutes; 6 minutes; 10 minutes.
Question. What is the penalty for overtime parking?
Answer. Usually $1 for first offense; $2, $3, $5, and $10 (various) for subsequent offenses.
Question. Are meters accomplishing what makers claim for them?
Answer. Nearly all yes.
Question. Is your meter system satisfactory?
Answer. Nearly all yes.
Question. Is your meter system an unqualified success?
Answer. 50 percent yes; 10 percent no; 40 percent no reply.
Question. Has city been held liable for damages to parked autos?
Answer. No, in all cases.

Just to give an example of the general attitude of the public toward parking meters, I will quote the following taken at random from the above report:

The meters have regulated parking and reduced traffic congestion considerably. The all-day parker is now using the free-parking lots provided by the city, or has moved out farther from the downtown business section.

A survey of public opinion made by a businessmen's association, in rural areas, shows that approximately 75 percent were favorable to the installation of parking meters. Local business men who were originally antagonistic to the installation of meters are now practically unanimously in favor of them. There is now considerable interest in the installation of additional meters.

DISCUSSION OF ABOVE PAPER

Mr. QUINN. Mr. Chairman, is there any information available from the Bureau in regard to the parking meters?

Mr. BEARCE. So far we have run only the tests of the time mechanism. One thing that we need to know, of course, is whether they keep reasonably accurate time. They have now been turned over to another division, where they will be tested as to mechanical features. So far we have not had the time at the Bureau to do more than that. Our report will be made to the Director of Traffic of the District of Columbia, who expects to write purchase specifications—perhaps three or four different makes will be procured. The meters will be installed in the business section of the city and will be paid for from the receipts of the meters so that they will presumably not cost the District anything—the meters will pay for themselves.

Mr. C. P. SMITH. Mr. Chairman, what would prevent some one dropping in another nickel when the original period has expired?

Mr. BEARCE. I would say nothing, unless a traffic officer in the neighborhood saw this done, in which event the person would probably be penalized.

Digitized by Google

Mr. MARTIN. Mr. Chairman, is there not a possibility that the use of these parking meters would result in an obstruction of traffic?

Mr. BEARCE. As far as I know they are always installed on a standard like this (indicating). They are in a space 20 feet long; presumably the parking meter will be near the front end of the space so that the traffic officer driving by can look over the automobile and see the condition of the sign.

REPORT ON JOINT CONSIDERATION OF TOLERANCES FOR VEHICLE SCALES BY COMMITTEE ON SPECIFICATIONS AND TOLERANCES OF THE CONFERENCE AND SPECIAL COMMITTEE OF THE NSMA, PRESENTED BY F. S. HOLBROOK, CHAIRMAN OF THE CONFERENCE COMMITTEE

Mr. Chairman and gentlemen of the Conference: At the meeting of the Twenty-seventh National Conference on Weights and Measures a certain amendment was made under the heading "Scales: B. General Specifications, paragraph B–2w 'Shift Test of Scales.' " This amendment, in brief, increased the tolerance on a corner of a vehicle scale in use from 0.20 percent to 0.40 percent, subject, however, to the provision that the algebraic mean of the errors on the two corners at each end of the scale shall not exceed the regular tolerance applied to the end, 0.20 percent. The amendment was made after a study of the results obtained by the Bureau in its program of cooperative testing with the States, which indicated the desirability of the change.

This amendment has received considerable attention since its adoption, especially at the recent meetings of the Western Railroad Scale and Weighing Conference and of the National Scale Men's Association. At the latter meeting a resolution of disagreement with the Conference action was defeated, or laid upon the table, and the National Scale Men's Association appointed a special committee to confer with your Committee on Specifications and Tolerances in relation to this matter. This special committee of the National Scale Men's Association is composed of H. M. Roeser of the Streeter-Amet Co.; H. H. Alfrey, of the Chicago, Rock Island & Pacific Railroad Co.; Harry Mayer of the Chicago & Northwestern Railway Co.; C. W. Crowley of the Western Weighing and Inspection Bureau; and R. O. Rask of the Alton Railroad Co. This committee sat with your Committee on Specifications and Tolerances a day or two ago, and there was a free and full interchange of ideas in relation to the condition of vehicle scales in various parts of the country and expecially in relation to the results which might arise in connection with the tolerance to be applied in the case of corner tests on vehicle scales. A great deal of interesting and valuable information was thus developed.

After this meeting, your Committee on Specifications and Tolerances weighed the arguments advanced by the special committee of the National Scale Men's Association. It had been strongly urged by the special committee that the amendment made, might result in some cases in adversely affecting the character of repair work and might lower the standards of the scale repairmen. To guard against this, your Committee came to the conclusion that a further amendment to the tolerances for scales would be advisable, and consequently the following proposed amendment has been incorporated in the general report of your Committee on Specifications and Tolerances, which is now available. This amendment will be considered on

Digitized by Google

Friday morning, when the Committee report will be brought forward for the consideration of the delegates.

SCALES: A. GENERAL DEFINITIONS.

Add a new paragraph to be known as paragraph A–2q, to read as follows: NEW SCALES.—Scales which are about to be put into use for the first time or which have recently been put into use and are being tested for the first time by the weights and measures official. Scales which have been reconditioned or overhauled or which have been condemned for repairs by a weights and measures official and subsequently adjusted or repaired, shall, upon the first test thereafter, be construed to be "new" scales for the purpose of the application of tolerances.

This amendment would require the application to the scales in question of the tolerances for new scales. It seems to your Committee that this is a very desirable and logical step. The tolerances on new scales are smaller—basically one-half the value—than the tolerances on scales in use, in order that the new scale may remain within tolerance for a reasonable time after it is put into use, even though it may depreciate and become less accurate. It seems that scales in the class just mentioned—reconditioned, overhauled, repaired, and adjusted scales—might well be treated in the same manner. Specifically, in relation to vehicle scales, this would reduce the basic tolerance to one-tenth of one percent on end test and distributed load test and to two-tenths of one percent on corner test, if such test is made. It would also suspend the special minimum tolerances on vehicle scales in use and would provide that the usual minimum tolerance on new large-capacity scales shall control, namely, one-half the value of one of the minimum beam graduations in the case of beam scales, and one-half the value of one of the minimum graduations on the reading face in the case of automatic-indicating scales.

(Signed) F. S. HOLBROOK, *chairman*,
CHARLES M. FULLER,
JOSEPH G. ROGERS,
JOHN P. MCBRIDE,
GEORGE F. AUSTIN, JR.,
Committee on Specifications and Tolerances.

DISCUSSION OF ABOVE REPORT

The CHAIRMAN. Have you any questions you wish to ask Mr. Holbrook at this time?

Mr. ROESER. Mr. Chairman, I had a little conference while this report was being read. While we are very glad to have the consideration that has been extended us we still do not like those tolerances. We think that the tolerances should be smaller. That is what the scalemen need to assure you people of having good scales. Scales that need big tolerances should either be repaired or replaced.

(At this point, at 3:50 p. m., the Conference adjourned to meet at 9:30 a. m., Wednesday, June 1, 1938.)

Digitized by Google

THIRD SESSION—MORNING OF WEDNESDAY, JUNE 1, 1938

(The Conference reassembled at 9:50 a. m., at the Washington Hotel, Dr. Lyman J. Briggs, President of the Conference, in the chair.)

APPOINTMENT OF COMMITTEES

The CHAIRMAN. The Chair announces the appointment of the following committees:

Committee on Resolutions:

C. L. Klocker, Connecticut, chairman.
Gardner K. Heath, Maine.
Barnett Kanzer, New York.
C. E. Tucker, California.
Manon L. Fowler, Highland Park, Mich.
Howard C. Patton, Pittsburgh, Pa.
Erwin J. Rogers, West Allis, Wis.

Committee on Nominations:

O. E. Brenneman, Ohio, chairman.
W. S. Bussey, Texas.
A. J. Jensen, North Dakota.
John J. Levitt, Illinois.
William Foster, Springfield, Mass.
B. W. Ragland, Richmond, Va.
Gilbert S. Smith, Cape May County, N. J.

SURVEYING WEIGHTS AND MEASURES FROM THE CONSUMERS' VIEWPOINT

By D. E. MONTGOMERY, *Consumers' Counsel, Agricultural Adjustment Administration, United States Department of Agriculture*

Mr. Chairman, ladies, and gentlemen, the talk I want to make this morning is not only on the survey and its partial results, but I want to have a conference with you about what we are doing and what we are going to do to bring the valuable work that you are doing for the consumer to the attention of the consumers since they know very little about the services that you are rendering.

I suppose that the average consumer in the United States thinks that weights and measures officials exist everywhere. I tested it out. They said as a rule, "Yes, of course somebody is testing our scales and measures," despite the fact that there are large areas where there are no means provided for any enforcement whatever and other places where they are niggardly in their provisions for enforcement. Even where the enforcement is well carried out there is undoubtedly great difficulty in getting the necessary funds and difficulty in getting across to the consumer the enormous value of the work you are doing for them. That is explaining the background, for I want to make it clear where we come in the picture. We are engaged in the collection of data to be used in consumers' education.

Digitized by Google

Last year, as you will recall, the National Conference passed a resolution endorsing a project for a national survey of weights and measures administration. Our idea was to find out first what is being done and we wanted also to get a survey of what the legislative authorization for your work is in the different jurisdictions.

One difficult part about it is to get the negative angle. We are getting the information back from the areas where there is enforcement but we are going to have to devise means to find out about other places where there is no enforcement officer or where his work is so small that he does not want to put it on paper. We will have difficulty in getting this information by the questionnaire method.

We mailed out about 430 schedules and received back about 160, which probably is a pretty fair return, considering the amount of statistical data called for on the two schedules. This coverage is enough at least to give us a basis for the development of the results of this work, so that we have this preliminary material to give to the consumers to begin with, to get them interested in weights and measures work. I want to take this opportunity to express to you my sincere appreciation not only for your cooperation in filling in the schedules, but also for the very fine supplementary material relating to your work and your problems, such as pictures, reports, and stories of enforcement activities, which many of you supplied. Those are particularly valuable for consumers' work because they are interesting and dramatic, and we will use them in reporting on this project in the "Consumers Guide."

To date we have a partial summary of data obtained from various jurisdictions. This, however, covers only part of the material. I will refer to that later, but first let me quote from some of the letters we have received.

Here is one from a city in the South.

> We have little or no weights and measures law and no one seems to want one. My job has always been looked upon as a political one. You were never expected to do anything and were a fool if you did. However, since I took office early in 1937, I have tried to give honest, efficient service under the existing law. Maybe a word from you based on these reports would be of some help.

Another sealer in an eastern State, having a jurisdiction a thousand square miles in area with a population of 150,000, reports that he has only one assistant to help him cover that area.

A State director of markets says:

> It is estimated that there are over 100,000 scales and many other weighing and measuring devices in my State that have never been tested. From information available, indications are that an average of about 35 percent of these scales are inaccurate, the larger percentage of them weighing or measuring incorrectly for short weighing or short measuring the public.

Here is a report from another sealer.

> This county long ago established the salary of this office at $1,550. The State deducts for retirement $9.35 per month. This leaves $27.65 per week for salaries. The sealer has to provide his own transportation, meals away from home, gasoline, and car service. It has not been required in the past that the sealer devote more time than the work required and he must necessarily have other income. To cover this territory twice a year to merely test equipment and make such inspection as can be part of this routine will take about 12,000 miles of travel per year.

I think it requires no stretch of the imagination to conclude that this county cannot expect effective weights and measures supervision under the conditions described.

Digitized by Google

The sealer of a western city of over 100,000 population writes:

I realize the enclosed report is not what it should be but when I took this department over, it was badly run down and the equipment the merchants in this town used for weighing and measuring was in terrible shape. I am handicapped by lack of funds and equipment. The ground to be covered here really requires the services of three men. Besides this, the city ordinance is very weak. It will take a long time to get conditions in proper shape. The newspapers have given me very little cooperation and the city attorney does not seem to particularly want prosecutions.

Now, a word about the type of information we are getting from the survey that we are making now. The survey forms are now in process of tabulation and I hope that some time this fall we shall have some very interesting facts summarized and ready to report to you and to the consumers' clubs. In the tabulations which we prepared on the State of California, based on reports from that State, I want to point out some of the items that I think will be of real interest to the consumers. The first table of statistics covers the cost of weights and measures administration. We find, for example, in California that the cost per person for weights and measures protection ranges from 2 to 10 cents and the cost per establishment using weights and measures equipment was from $1.41 up to $6.31. That is an important fact to know, because of the situation that the consumers have very little knowledge as to what weights and measures protection actually costs them.

The second table has to do with the amount of work officials have to do. The statistics here give the relation of the size of the staff to the total population and the number of establishments. In some California jurisdictions, there is one staff member for every 22,000 of population, but in the jurisdiction that provides only 2 cents per person for weights and measures protection, one staff member was caring for a population of 148,000. Certainly this county needs to increase its expenditures for weights and measures and to enlarge its staff.

Other information deals with the percent of establishments visited and the number of visits to each establishment. For the jurisdiction that was spending only 2 cents per person only 78 percent of its establishments were visited. Another jurisdiction was only 82 percent covered. Other jurisdictions reported complete coverage. I suppose that means that they were visited at least once a year.

The remaining tabulations will deal with the condition of the different types of weighing and measuring equipment. One of the tables will summarize all kinds of scales, the total number examined, and the numbers that were approved without adjustment, approved after adjustment, condemned for repair, and confiscated. It will show, for example, that in one California county only 37 percent were approved without adjustment. In some other counties 50 percent, 68 percent, and 91 percent—the highest figure—were approved without adjustment. The State report shows that 61 percent of all the scales were approved without adjustment.

In regard to gasoline and lubricating-oil pumps, how many of those got by without adjustment? Well, we have some figures on that. In one county only 37 percent passed, in another county only 54 percent, in another county 72 percent, and so on to one county where the figure was 97 percent. That kind of information will come out of this

Digitized by Google

survey from all parts of the country, and will be put up in such shape that I hope and expect will interest the consumer.

I should like to use the remainder of my time for consideration of some of the ways in which we might cooperate to improve weights and measures protection for consumers. Our resources are so limited and the field is so broad that the only practicable way to proceed is to select certain projects where our efforts will do the most good and then to concentrate on them. I should like to suggest four projects for the coming year: First, the promotion of the use of standardized packages for consumer goods; second, improved practices for the selling of poultry; third, checking the methods of sale of gasoline; and fourth, an improved program of public education with regard to weights and measures affairs.

The thing that is most needed is to get a response from large numbers of consumers and that can be done through interesting dramatic stories of situations which you have found built around a fairly limited project, for example, the need of standardizing package goods.

Now, with regard to packaged goods, I think we sent each of you a letter from Alex Pisciotta of the New York City Bureau of Weights and Measures on the subject of the packaging of tea and bacon in odd-weight packages of 6 or 7 ounces instead of the usual ½-pound size. He also points out the use of the 3½-ounce instead of the 4-ounce, the use of the 7½-ounce instead of the 8-ounce package, and that these short-weight packages are being delivered to the consumers when they are asking for 1-, ½-, or ¼-pound packages. The consumers, however, are not acquainted with that. Perhaps if you will look into the matter during the year you can furnish us with material that we can use to get these facts across to the consumers and encourage them to make a particular drive on that question.

E. K. Strobridge, Sealer of Alameda County, California, stated, "In 1923 we checked olive-oil packaging and found 22 different sizes of containers ranging from 4 to 32 ounces in size." In his letter he went on to say, "Very much to my surprise, in making addresses to the senior classes in high schools, we found in asking students the number of ounces in a pound or a pint that they could not give the answer. This same condition existed in addressing the summer school classes which are largely attended by teachers. From my observation the general public as a whole does not realize how many ounces there are in a pint." You may be sure that we are going to let the consumers know that they need to brush up on their knowledge.

It is probably true, as S. T. Griffith, Sealer of Baltimore, says, "Probably no relief can be had locally unless concerted action is taken throughout the country." I do not know what action this body can take officially. If any action is taken we shall give it wide publicity. I wonder if it is feasible to have test purchases made in widely separated jurisdictions of the tea put up in 3½- and 7-ounce packages. These purchases would show if consumer deception is actually being practiced. The results could be collected and used for concerted action on a national basis.

L. J. Hoffman, City Sealer of Poughkeepsie, New York, in his letter on packaging suggested additional action, saying, "I would go one step further and suggest that the size of cans be also standardized." I should like to second that viewpoint. Mr. Warner talked to you

Digitized by Google

about the standardization of can sizes last year. As you know, there has been a bill introduced in Congress by Mr. Sauthoff, of Wisconsin, H. R. 6964, to reduce the number of can sizes to eight standard containers. Hearings were held on that bill, but it was laid over and no action was taken. However, any facts that you can give us showing the need for this type of legislation will be appreciated. I know you have no free money and free time usually available, but would it be possible for you to begin to make a record of this question of the variation in can sizes so that the need of such legislation, if there is a need, can be clearly demonstrated? Personally, I haven't any doubt in the world that there is a very great need because we have found that the consumer was up against an impossible problem of calculation to determine how much he was paying for the product, based upon the price and the contents of the cans. It was impossible to determine whether one can was worth more than another. Even if we only get a small amount of data from each jurisdiction, why even that will give the picture and show the consumer what he is confronted with and what the merchants are confronted with in selling brands in competition. And that information can be very well presented in a demonstration to Congress. In the past hearing at the United States Capitol evidence was put in the record by the can manufacturers' representatives that there were 258 different sizes of cans for fruits and vegetables.

Probably the sale of poultry is another subject on which we should try to concentrate some attention during this next year in order to get our story across to the consumer. That is indicated by the stories which we have received about the method used in selling poultry. Let me read you some of the correspondence that we have had regarding this.

Mr. Strobridge, Sealer of Alameda County, California, states the problem this way:

> One condition we have to deal with which is causing us lots of grief is the sale of poultry. When a woman buys a chicken it is slammed on the scale, weighed, and taken off, and then she asks to have it dressed, so there is no opportunity for the weight to be checked. We have shoppers making purchases from time to time and when purchasing a chicken the shoppers state that they intend to dress the chicken themselves. Then it is put back on the scale, weighed the second time, and on numerous occasions a new price is quoted.

John P. McBride, Director of Standards for the State of Massachusetts, says in a report:

> Complaints have been received, particularly in relation to poultry, to the fact that poultry originally purchased has been removed to a rear room for the purpose of dressing, and the ultimate delivery has not been the poultry originally selected.

In both New York and Chicago, dealers have been caught inserting lead plugs in the lower intestinal tract of poultry. In Dallas, Tex., one shop was found giving poultry a shot of sour mash with an automobile grease gun. In Milwaukee two weighted goose heads taped together to form a compact mass of feathers were palmed on and off the scale with every fowl weighed. It was estimated that these two goose heads were costing Milwaukee consumers about $20 on busy market days. Now, this evidence seems to indicate that consumers need to have special warning with regard to the purchase of poultry, and that weights and measures officials need to give very careful supervision to the selling of poultry.

Another matter that has come up for consideration in connection with the sale of poultry is the selling of dressed and drawn poultry

Digitized by Google

by the piece instead of by weight; the dressed and drawn fowl would be wrapped in Cellophane and a weight would be stamped on the package. However, it would be necessary that the birds be given a definite price. Thus certain tolerances would have to be allowed. In certain cases where the dressed and drawn fowls were purchased there was a variation of the actual weight from the weight marked on the Cellophane of as much as 3 ounces. The variation of the price per bird was as much as 10 percent, 3 cents a pound and more. Consequently, our idea was that this method of selling poultry was not a satisfactory one for the consumer. We want to know the exact weight and the exact price at the time of purchase in order that the purchaser can decide what to buy.

Now, what methods of education of the consumer are available to you? We have just prepared and put up here on the wall a large number of posters calculated to attract the consumers' attention. They all relate to weights and measures. We will have prepared and send to you a circular describing what these posters are and how they may be made available to you.

Another thing that can be done is to use moving pictures. A news review bring currently shown in first-run movie houses throughout the Nation devoted one-third of its program time to weights and measures. You may care to see this movie while you are in Washington. We were asked to give some help in the preparation of that picture and, of course, we did that. We got back a very enthusiastic report as to the reception that these pictures received. We will get a copy of this film.

There are now available two other motion pictures dealing with weights and measures. George F. Austin, Jr., Weights and Measures Inspector of Detroit, Mich., has a short film showing the activities of his department taken from a full-length movie on the services of the Detroit Municipal Government. Allen W. Corwin, Sealer of Allegany County, New York, has a two-reel movie on weights and measures.

A third method of educating the public on weights and measures affairs is by radio. A number of sealers sent in radio speeches with their questionnaires. Please send us copies of any of your future broadcasts. More sealers should use this method of reaching the consumers. The Consumers' Counsel Division in cooperation with the General Federation of Women's Clubs puts on a weekly 15-minute radio program over the Red Network of the National Broadcasting Co. We expect to devote several of these broadcasts to weights and measures affairs. If you so desire, I shall be glad to see that you receive copies of these broadcasts.

Newspapers and magazines are always ready to print interesting and worth-while stories. Many clippings of weights and measures stories have been sent into our office. Some of you have probably seen the story by Robert Littell in the March Readers' Digest, called "Weighed and Found Wanting." I hope that more magazines can be encouraged to carry similar articles.

I want to make one suggestion relative to your own annual reports as an educational device. Most of the reports sent in were largely statistical in nature and a general discussion, if any, was often presented in very formal language. If the form of your report is set by legal requirements, I wonder if a special report put up in a more interesting fashion could be prepared for public distribution? A

Digitized by Google

report giving the interesting high lights of the year's work in terms of consumer welfare is one of the best ways of winning public support. For instance, I have just been looking at the annual report that Mr. Fuller gets out. It is very attractively gotten up to interest the consumers in what they are doing, and I think that is extremely important. In his opening statement he gives some figures that will make consumers sit up and take notice. He says:

> When you learn that 38,731 scales and other weighing and measuring devices were found incorrect in Los Angeles this last year and were either adjusted to accuracy by our deputies, condemned for use until repaired and rebuilt, or condemned and confiscated or destroyed in this one year, it emphasizes the fact that if it were not for the constant work of this department, the loss to the consumer and, in some cases, to the merchants themselves, would be tremendous.
>
> The majority of high-priced merchandise is sold over computing scales. Of these 9,081 were found incorrect; 6,753 being adjusted to accuracy by our deputies; 2,247 condemned for use until repaired, rebuilt, and then sealed correct; and 81 condemned and confiscated.
>
> Twenty-two thousand, one hundred and eleven gasoline measuring pumps and meters were tested, nearly 15 percent, or 3,340, of them requiring adjustment or repairs before they could be sealed correct.

Facts like these printed in attractive form make consumers take an interest in weights and measures departments.

Mr. Fuller told me this morning that he is asked to spend a great deal of time addressing small groups, say of only 30 or so, and he hasn't the time, when he has so many other duties to take care of. We have in our organization throughout the country a large number of people who, from one angle or another, are known to be interested and active in consumers' work. I think in many places we can find you the people who would come to your office and get your story, popularize it, and carry it out to the groups with which they are working.

I don't think there is any doubt that where weights and measures protection is inadequate it is simply because the consumers do not know what can be done. First of all, they do not know what the hazard is that they are running when they do not have weights and measures enforcement. Then, they do not know to what extent weights and measures protection saves them from those hazards. And, thirdly, they do not know how very little money per person a year it costs to get that adequate protection. Now, that is the story that we are trying to get across to the consumers. Thank you.

DISCUSSION OF ABOVE SUBJECT

Mr. SPENCER. I am located in Oneida County, the exact geographical center of the Empire State. During the time that I have devoted to this work, which embraces about 14 years, I have spoken before almost all of the men's clubs, men's brotherhoods, churches, and lunch clubs not only in my own county but in three adjoining counties within a radius of 35 or 40 miles. The greatest trouble that I have found in weights and measures work is that the public whom we serve, know so much that is not true. Most of their information is misinformation.

Mr. Montgomery gives some figures on scales that were incorrect. He did not give us any figures as to whether those scales were cheating the customers or the merchants. Every man engaged in weights and measures work in this room knows that there is a goodly percentage of defective devices which are cheating the merchants and not the consumers. I hold no brief for the merchant, but I believe it is a fair

Digitized by Google

statement of fact that the merchant has been bedeviled enough by customers and other agencies. I know that the merchants in my territory in Central New York are trying to do an honest job and I believe they are entitled to credit. I have not failed in any particular to get a fine spirit of cooperation from my merchants when I approached them in a cooperative spirit.

If, as, and when, the Consumers' League of which Mr. Montgomery speaks does put out its publicity, I believe that what they do put out should be submitted to a few of the directors of the various States so that the information may be of a constructive nature rather than of a destructive nature and concise enough so that those purchasers of foodstuffs who will be interested may be able to grasp the complete details.

Take a can of tomatoes as an illustration. You can select three different brands, one selling at three cans for 25 cents, one selling at 12½ cents, and another selling at 15 cents. I dare say that if your merchant took the pains to explain the difference in the quality of the various packs, you would find that the 10-cent can was about half water, that the 12½-cent can was a little less than half water, and that the 15-cent can was a good solid pack and the cheapest buy. Much of the faultfinding on the part of the public is because of their own lack of knowledge and, in many instances, their own lack of desire to know.

Mr. J. G. ROGERS. In the State of New Jersey we have a regulation that does not permit the sale of poultry by the piece. Now, there are certain packing industries which have come on the market with drawn and dressed poultry; they have a frozen product, furnished from a centralized point and wrapped in Cellophane. We modified our regulation for this reason: They do mark on every individual piece the net weight, and while there is a variation between the various units as sold for various prices, we do not think that there is any deception as to the price for the simple reason that the person has the opportunity of seeing exactly what he is getting. Now, there is a variation as Mr. Montgomery says of probably 3 or 4 ounces, but that necessarily has to be. Of course, in their newspaper advertising they state that the poultry is being sold at a unit of not less than a certain weight. Of course, the public is paying a greater price per pound, because all waste has been eliminated in the unit pieces. The housewife coming into the store will see a lot of this poultry on display, and she will pick out the pieces that weigh the most for the same money.

Mr. MCBRIDE. I rather subscribe to the theory enunciated by the gentlemen from New York that while publicity is a good thing it is well to know that some of the things that are being publicized today seem perhaps a little exaggerated. Now, we take a lot of pride in Massachusetts in the work that we do, and it seems to us that some of the publicity in regard to defective devices and practices should be identified to particular jurisdictions because it does more or less reflect on jurisdictions where weights and measures administration has been satisfactory and regulations have been properly enforced for some period of time.

The thought of acquainting the consumers with the necessity of proper protection is all right and is honestly motivated, but I do not think that it should be overdrawn, and I think it should be done with proper caution so that the public is not unduly alarmed.

Digitized by Google

Mr. PISCIOTTA. On the question of the sale of poultry by the piece, I think that we are going to get away from real weights and measures work if we do not insist that food products be sold by weight; poultry is a meat product, and it is my honest opinion that it should at all times be sold by weight. The consumer would hesitate to pay 40 cents a pound for a piece of frozen poultry if she realized that it was 40 cents a pound, but when you say that it is $1 for a piece, she does not determine what that piece is actually costing her by the pound and will buy it. We have the same situation in New York, where they are trying to sell squabs by the piece. Now, the butchers tell us that this is ridiculous to try to sell squabs at 85 cents a pound when they are able to sell them for 85 cents apiece. So, you see there is a way of getting around and deceiving the consumers to make them buy something that ordinarily they would not buy.

If we are going to try to bring people back to buying by the pound, then we should also try to stop any exception. If we have an exception of poultry and squabs, why we will have the butchers and packers coming in for other exceptions. Then all the work that we are trying to do will come to naught.

Mr. CROCKETT. I would at this time like to call to your mind a motion picture which did a great deal of harm in this country, because it portrayed every man in business as a crook. Now, we men in the weights and measures field know that there are plenty of honest men in business. We can do harm to the man who is trying to do an honest business if we are not careful.

We are running a consumers' education campaign in Baltimore. Now, Mr. Spencer says that some of the consumers do not want to find out. He probably is referring to some of the older folks. We educate the people—not necessarily men and women and fathers and mothers—but high school boys and girls who will be the future citizens. We have made many talks to them and we have told them that there are many men in business who are honest.

Mr. CULLEN. In Pennsylvania the question arose whether poultry should be sold by the piece or by weight. I took the matter up with the Attorney General of the Commonwealth and he decided that poultry must be sold by weight under the commodity law. We had a test case in Philadelphia and a defendant was fined $10 before a local justice of the peace. He took an appeal and the court sustained the ruling, so in Pennsylvania poultry must be sold by weight.

Mr. FULLER. Mr. Chairman, it is certainly necessary and essential in all our publicity that we emphasize the fact that this work is just as important for the protection of the honest merchant as it is for the protection of the public. In the motion picture spoken of there was an incident of throwing a turkey around. That was an actual case that occurred in Los Angeles. We arrested the manager and certain employees of the market and each one of them was convicted after having had a jury trial. I want to say that the honest merchants in town were very much gratified over the action that was taken and it had a mighty healthy effect.

Mr. GRAEFF. In the city of Baltimore we have an ordinance which states that live or dressed poultry must be sold and advertised by avoirdupois weight. There is no provision in regard to the sale of "game" and unfortunately squabs and ducks, having been designated as "game," do not come under the ordinance, and therefore are being sold by the piece.

Digitized by Google

Mr. KANZER. Within the last few days a circular letter was mailed from my office to every weights and measures official in the country and to all packers and dealers and dealers' associations. I will read the letter.

ADVERTISING AND SALE OF POULTRY

For some time, and recently more than ever, the problem of the advertising and sale of poultry has been brought to the attention of the Bureau from many sources—the packers, the retailers, the consuming public, and a great number of weights and measures officials. Complaints are being received daily by this Bureau calling for action.

The advertising of poultry, particularly with reference to the sale of chickens, has reached a confused and misleading state due to the numerous phrases used in the advertisements. Legal problems have entered with reference to each and every type of advertisement, legally difficult to solve.

The wording varies as follows (using 89 cents as a quoted price):

"89 cents each."

"Not less than 2 lbs. 3 oz.—89c."

"Dressed chickens, 89c each."

"Weight, when drawn, 2 lbs. 3 oz.—89c each."

"Weights 2 lbs. 3 oz. to 2 lbs. 9 oz.—89c each."

"Weight, after fully drawn, 2 lbs. 9 oz. and not less than 2 lbs. 3 ozs." etc., etc

Evidently some of these are definitely against the regulations as now issued, but some contend their phrases are within the present regulations; at any rate, the consumer is becoming confused and the sale itself is confusing.

It is very desirable and necessary to have this matter clarified, and it is therefore suggested for the purpose of discussion that the following regulations be issued. (These regulations are not being issued, they are advanced solely to bring out a full discussion.)

This letter is being sent to all State weights and measure officials, the packing industry, the retail meat dealers, and other affected interests, and your name or association we consider as being vitally interested in this problem.

SUGGESTED REGULATIONS

1. Poultry shall be offered for sale or sold by net weight and the words "offered for sale" to include all advertisement through any medium.

* * * * * * *

3. Poultry shall be offered for sale, sold, or advertised at price per pound only.

It is now earnestly desired to get your reaction to this matter by correspondence, and please write to me in full giving your thought on this problem. Later, a conference will be called of all interests affected by this ruling, at which time definite rules and regulations will be drawn up for the guidance of the industry and the public. It might be necessary to have added legislation on this problem, and it is expected this conference will determine this point.

Your constructive advice and criticism are requested and I seek your cooperation to clarify this problem.

BARNETT KANZER,
Director, Bureau of Weights and Measures.

Circular Letter 6, May 23, 1938.

Mr. ENGELHARD. There are other phases of Mr. Montgomery's paper which deserve a lot more consideration than this one of drawn and dressed poultry. One of these points was very well presented by the gentleman from New York. We do not want to make the consumer feel that every time he walks in any merchant's place of business he has to look out for himself. In my jurisdiction—Middlesex County, New Jersey—every merchant depends on honest business and has plenty of worry to take care of his overhead. He wants to keep his trade and get new trade if he can, and there is every incentive for him to give honest weight and measure and retain his customers. We are becoming educated to the extent that a lot of the housewives have their own scales and check purchases. If a woman buys four

Digitized by Google

dollars worth of merchandise per week in a store and she finds one or two of the items that she buys are short, and then finds this situation a second time, that merchant has not gained four cents by cheating—he has lost a four-dollar-a-week customer. I submit that the merchant will do everything possible to keep his customers and stay in business.

Mr. MONTGOMERY. I am quite surprised that this controversy has developed, because I did not think my remarks would be construed as a drive against the merchant. I thought that we could develop the subject so that through the merchants' associations and through other associations and groups we could build up a demand from the consumers for proper weights and measures enforcement. When a merchant cheats he will have an advantage until his competitors do likewise, and thus you have the dishonest merchant dragging down the whole group. The honest merchant has as much interest as the consumer in seeing that there is a standard established and that the standard is enforced. I quite agree with everything that was said about the necessity of keeping the merchant in the picture. I do not think there is any question but what we can get the honest merchant to back up this consumer drive and back up the work you people are doing.

Mr. LEONARD. I believe that selling poultry stamped with the net weight is the fairest way of giving the consumer an opportunity of getting what is paid for, and it also protects the man that sells it. If a person buys a chicken and it is weighed and afterwards cleaned and cut up, how is any weights and measures man going to detect incorrect weight? On the other hand, if a lady buys and pays for a chicken marked 4 pounds, 7 ounces, and afterwards discovers that she has only a 4-pound chicken, why then you have a case. I believe in stamping net weight on poultry.

Mr. O'KEEFE. I think that you gentlemen are losing sight of the program as projected by the Consumers' Counsel. Why don't you furnish the Consumers' Counsel with data about the packers who are sending out slack-filled packages and so forth, and that information can then be disseminated?

LICENSING OF SCALE MECHANICS

By W. S. BUSSEY, *Chief, Division of Weights and Measures, State of Texas*

Mr. President, members of the Conference, and guests: The subject of proper control and adequate supervision over persons and firms engaged in the business of repairing weighing and measuring devices and selling used devices, has become a very common topic of conversation in weights and measures circles throughout the country, and the law-making bodies in several jurisdictions, have already taken the initiative to enact regulatory measures along this line.

The National Conference was favored last year, with a splendid paper presented by Alex Pisciotta, of New York City, explaining their ordinance on this subject, which provides a licensing system for those so engaged, and telling us of some of the benefits resulting therefrom. A few of the other jurisdictions have followed in the footsteps of New York City, by enacting similar laws, while others have become interested to the point that widespread investigations concerning the subject have been conducted, hoping to devise some means to successfully cope with the bad situation that is more or less prevalent all

Digitized by Google

over the Nation. Some of these investigations have been quite broad in their scope and much worth-while information has been derived therefrom. The experiences of officials in those jurisdictions where such laws have already been enacted, have also provided many valuable ideas, concerning the subject. And I am thoroughly convinced, that some very constructive work can be and is being done along this line.

There is no doubt but that the necessity for such regulations is present in practically every jurisdiction in the United States. However, conditions will probably vary in the different localities and the need for such regulations in Texas, is probably greater than in those jurisdictions covering a smaller area. For it is a fact that the vast area of our State does provide a very fertile field for the operations of the unscrupulous "fly-by-night" or "gyp" scale mechanic. It might be possible in some of the smaller jurisdictions to handle all weights and measures inspections, condemnations, releases, etc., entirely in accordance with the letter of the law, but this is a physical impossibility in Texas, and it is no doubt the case in numerous other States. We, therefore, feel a very urgent need for some sort of control over this unwholesome condition, that more confidence and dependence might be placed in the repairman.

The business of supplying weighing and measuring devices and repairs thereto, to the people of this Nation, by virtue of its importance to commerce and industry, should be a highly respected profession. But such is not the case in our State. Yes, we have some fine men in the business, but we have others who are not and they are tearing down, faster than the good men can build up. You know it is much easier to wreck than to build. We have men engaged in this business who are anxious, and are striving hard, to put the business on the high plane that its importance rightly demands. I believe that we, as weights and measures officials, should do our part to help them with the job.

We in Texas, like to discuss our problems with our neighbors. We appreciate receiving the wise council and advice of our weights and measures associates in other jurisdictions, as well as of the equipment manufacturers and the representatives of other industries who are so vitally interested in what we are doing. Bearing these things in mind and realizing the importance of the subject and the intricacies involved in the proper solution thereof, the Texas Weights and Measures Association appointed a committee of seven members representing the weights and measures fraternity and the scale industry to investigate the subject of "Licensing Scale Dealers and Mechanics" and report back to our third annual conference, which was held in Dallas, Tex., on May 4 and 5 last. This committee devised the idea of preparing and sending out a questionnaire, to various interested parties, not only in Texas, but throughout the Nation. A splendid response was received from this questionnaire, and the overwhelming majority favoring such legislation was almost unbelievable. In fact, only three negative answers were received and one of these was with certain reservations. Of the three, only one was from a person actively engaged in a business which would be directly affected by such regulations and not one of the three answered the questions as prepared by the committee, but each wrote a letter, stating that he was opposed to such legislation.

Digitized by Google

Based upon the information furnished by the questionnaire, the committee prepared a most enlightening report, mimeographed copies of which are available at the secretary's desk for those who may desire them. In studying this report, you will see that it was the opinion of the committee that mechanics should be licensed; that they should be classified according to the types of scales which they were qualified to repair; and that they should be required to stand a practical, common-sense examination. The committee did not feel that the licensing of dealers was necessary, as they believed that the sale of new devices could best be controlled through "type approval" and that the sales of used devices do not reach sufficient proportions in Texas to require special legislation. Also, they believed that the used-device business would be handled largely by licensed mechanics anyway.

Our association also appointed a committee to investigate the subject of licensing gasoline-pump dealers and mechanics, which committee was also composed of seven members and represented the weights and measures fraternity, the pump industry, and the oil industry. Although this committee did not go into the subject as deeply as did the scale committee, they did make a very good report, copies of which are also available at the secretary's desk. It was the opinion of this committee, that it would not be practical at this time to license either pump dealers or mechanics in Texas.

In closing, let me emphasize that, judging from the results of the questionnaire sent out by our scale committee, there is not the slightest doubt that such legislation is needed and is also wanted by practically everyone who is interested, directly or indirectly, all over the Nation. Take a copy of this committee report, read it, study it. If you were mailed one of the questionnaires and neglected to fill it out and return it, do so when you get home. We are still anxious to secure all possible information and ideas, preparatory to drafting a bill to be introduced at the next session of our legislature. If you did not receive one of the questionnaires, write us a letter anyway and express your views on the subject; we will appreciate it greatly. I thank you.

DISCUSSION OF ABOVE SUBJECT

Mr. J. G. Rogers. I want to say that New Jersey has just passed such legislation. I have the finished product in my hand. We think a whole lot of it. It is a product of a great deal of study and there is no question but what there were a great many angles that had to be worked out. We found it absolutely necessary to have such legislation adopted as the situation in New Jersey was getting out of hand. Unqualified mechanics were operating in New Jersey to the decided detriment of merchants and were very troublesome. The new legislation among other things sets up a provision that mechanics shall undergo a technical examination in order to establish their qualifications to do equipment repair and installation work, and they must be licensed under the act to operate. We believe that this new bill gives full coverage and authorizes proper regulatory requirements, and it will be fully enforced.

I want to say that before we got this act adopted we had to overcome quite a number of obstacles. The utilities men were opposed to it because they thought that we should not have jurisdiction over their equipment mechanics and we believed the same thing. As the act is

Digitized by Google

drawn it does not interfere with them. Also in private industry, factories may have a battery of scales and their own maintenance department. Of course, we contend such mechanics are under the direct control of the factory employer and are therefore not within our jurisdiction. The law is primarily aimed at the mechanic who goes around as a business or a part of a business directly engaged in the sale or repair of used devices or installation of such devices. It does not apply to anyone who sells new devices.

Incidentally, I might state that in the presentation of this act for passage we also presented a brief which covered the subject very thoroughly and particularly discussed the case where devices were taken in trade for new equipment and then were sold without being properly repaired and thus were put back in commercial use. In this act there are some very definite provisions covering that. The act provides for a $25 fine on the firm and a $5 fine on the mechanic.

A particularly good feature of this act is the provision for an examination by a board of competent examiners, which the mechanic must undergo in order to get his license. He does not have to pass a general examination for all types of equipment—although he may do so if he thinks he is qualified—but he can be licensed for a certain type of equipment.

I want you to know that this law passed without a dissenting vote. It was signed by the Governor without any objection or any question being raised about its merits. The benefits of the act appear to be very obvious to everybody.

The CHAIRMAN. Gentlemen, since our meeting last year the administrative staff of the U. S. Department of Commerce has been enriched by the addition of Richard C. Patterson, Jr., as the Assistant Secretary of Commerce. Mr. Patterson is an engineer by profession; he is deeply sympathetic with and appreciative of the work which you are doing, and he has kindly consented to address you for a few moments. I take great pleasure in presenting to you Mr. Patterson, Assistant Secretary of Commerce.

ADDRESS BY HON. RICHARD C. PATTERSON, JR., ASSISTANT SECRETARY OF COMMERCE

Before leaving Washington several days ago Secretary Roper requested that I extend his best wishes and cordial greetings to you who are attending the Twenty-Eighth National Conference on Weights and Measures. He regretted deeply that a previous engagement in New Orleans made it impossible for him personally to attend your meeting again this year. As those of you who have attended previous Conferences well know, the Secretary is thoroughly appreciative of the value to business and the American public of the program you have undertaken. It is certain, therefore, although absent, he will be keenly interested in the report of the proceedings of this Conference.

Speaking for myself, I have so recently assumed my duties in the Department of Commerce that I hesitated to appear upon your program as a Government official. It seemed somewhat presumptuous to assume that one who had been in Federal Government service for such a brief period could present anything of value to you who have had many years of experience in important administrative positions of State, city, and county governments. However, I have

Digitized by Google

welcomed this opportunity to learn something about the character of your organization and the qualifications of the men composing it.

Dr. Briggs has informed me that you are engaged in the administration of weights and measures laws involving the testing of machines and mechanisms used in the commercial determination of measured quantities of goods. It was explained to me that you are profoundly interested in the details of construction of such apparatus. This knowledge you find essential in assuring the user of the apparatus and the consumer with whom he is dealing that the machine, when approved, will accurately function as intended. Equally essential, I am told, are reasonable safeguards against any manipulation of the device for the purpose of defrauding the purchaser of commodities.

Finally, it appeared that among your invited guests are many who design and supervise the construction of measuring machines. With these facts before me I no longer hesitated to accept the invitation to speak to you, since, as a trained engineer, I could be assured that I would be among friends.

In studying the activities of the National Bureau of Standards with respect to the maintenance of standards of weights and measures, I am particularly interested in the relationship between this Bureau and agencies which you represent. We in the Department of Commerce recognize, first of all, that we share with you a joint responsibility in perfecting the means of attaining a reasonable degree of exactness in day-to-day commercial transactions. No matter how carefully our primary national standards are developed and maintained, they are of little practical value unless properly observed by those who use them. In this phase of the work our Federal Government agency occupies a position that is essentially one of coordination. This forum is provided so that by free exchange of ideas and experience, the representatives of State, county, and city agencies may develop a uniformity in local practices which will adequately serve our national requirements. Without such uniformity our modern methods of production and Nation-wide distribution of goods, manufactured or processed by a single corporation, would not be feasible.

In organizing this forum, however, we do not seek to impose uniform procedures from a central authority. Our responsibility is to coordinate the activities of the agencies you represent and to cooperate with you in serving the needs of business and the consumer which become more exacting as science progresses.

From the viewpoint of the business executive the maintenance of our standards and the development of more exact measuring equipment is a service which provides some of the tools essential to production and distribution. We are constantly seeking new refinements and improvements which will make these tools more useful. In referring to this service I would like to quote a brief portion of a talk which I gave at the Boston Conference on Distribution. This excerpt appeared in October 1935, in Domestic Commerce, a publication of the Department of Commerce, and reads as follows:

> I think it ought to be clear that the job of American business is only half done when we have created new products or made old products better. There is the equally important job of creating new appreciations or lifting the level of the old appreciations. Our equipment is really the passport to a new way of life. The more we desire that way of life, the more we will want to possess the equipment that makes it possible. We will not only want the equipment. We will want the very latest model of it. Thus, the things that people buy from business can be

Digitized by Google

very largely measured in terms of the values they desire from life. I do not believe that we will ever get to the place where we will cease to see a better and richer life ahead of us. But if we should get to that place we would then cease to buy many of the things that put that life within our reach.

Therefore it is a business fact of major importance that, during these recession years, there has been an increase in what I might call the quality-aspirations of the American people. People have not bought so many of the things with which those aspirations can be satisfied. But that has been due to a falling off in income. It has not been due to any falling off in desire. That, I think, is important. Perhaps the American standard of living has declined. I am convinced that any such decline is temporary. It is temporary because it is not a part of the American make-up to be satisfied in such a situation. One characteristic of our people is their irrepressible desire for something better.

I have not changed my viewpoint since I wrote that 3 years ago.

The maintenance and observance of constant standards is not only a service to business at home but to those engaged in foreign trade as well. Just as we have a monetary basis which bears a definite measurable relationship in terms of gold to the currency of other countries, we must also have standards of weights and measures which can be similarly related. To the scientist or engineer the definition of our pound and inch in terms of the metric system is regarded as essential to the orderly progress of scientific knowledge. To those engaged in foreign trade, however, these relationships constitute a basis for equitable commercial dealings.

This is significant because we are now engaged in promoting our trade with other nations as one of the means of restoring normal business activity. The annual observance of Foreign Trade Week has just been concluded. During this period we have observed an increasing interest among business executives in the opportunities for expanding our markets abroad. Export statistics for many industries show that the Reciprocal Trade Agreement program has already been instrumental in reducing tariff barriers and other restrictions sufficiently to permit a greatly enlarged volume of foreign shipments. While the volume of our trade with other countries last year was approximately 30 percent below the peak of 1928 and 1929, the total value of our exports and imports was almost six and one-half billion dollars.

With the decline in domestic business activity our export trade has been providing a livelihood for a larger proportion of our population than at any time since the early Twenties. The automobile industry, machine tools, aircraft, and even the textile industry are this year steadily expanding the ratio of their exports to domestic sales. Thus, our foreign trade helps to sustain employment and purchasing power and is of benefit to us all.

Although we do not usually regard the enforcement of accurate weight and measure standards as a part of the foreign trade program, I believe you will agree that our cooperative efforts should be based on a recognition of the increasing importance of this phase of business. It should be evident that, in preserving the exactness of our measurements, we engender further confidence among foreign purchasers in the integrity of American business methods, and thereby assist in developing markets abroad for our agriculture and industry.

The CHAIRMAN. Mr. Patterson, the conference is deeply indebted to you for this. We wish very much that you might stay with us, but we understand that you have another engagement. I know everyone here wishes me to express to you our thanks.

(At this point Vice President Rollin E. Meek assumed the chair.)

Digitized by Google

PAPER MEASURE-CONTAINERS

By S. T. GRIFFITH, *Chief, Division of Weights and Measures, City of Baltimore, Md.*

Most weights and measures officials have at some time in their work been confronted with the problem of paper measure-containers. What disposition they have made of the same, except in the instance of a few States, is not a part of the records of this Conference. In perhaps one-half dozen jurisdictions certain types only of paper measure-containers have been officially approved for use as measures and given the State's serial number, which is required to be imprinted on said paper measure-containers.

The use of paper containers in the handling and dispensing of food products has increased so rapidly in the past few years that it is very evident some recognition and action should be taken by this National Conference, when such paper containers are designed and may be used in trade as measures. Thus, it would appear that uniformity throughout the country is most desirable.

There is no doubt that the economy and facility in the promotion of business is greatly enhanced by this very popular and inexpensive medium. Those concerns engaged in the handling of food products, particularly, find the use of paper measure-containers speeds up their business, increases their sales, and provides a consumer demand not usually accorded when only paper wrappings or trays are employed. The low cost and the quickness of handling, together with the easy disposition of the empty container, appeals to both the merchant and the customer.

The paper measure-container has naturally evolved from the paper drinking cup, which all of us have known for many years. It was probably the first paper container manufactured to hold liquids for public consumption. Since that time, a little more than a decade ago, this cheap and flimsy paper cup has been developed by the manufacturers, until now we have nearly 100 different kinds of paper containers, some of which are strong enough to bear the weight of a man. These paper containers are found to be very practical in the handling of liquids or solids. The evolution of the paper container has developed as the needs of trade required, or as the ingenious manufacturer could find new fields for its use. The application of this convenient paper measure-container to new purposes has progressed until today there is hardly any field in the purveying of either liquids or solids which cannot be handled fairly successfully in paper measure-containers.

In many jurisdictions where no official action has heretofore been taken, the supervision of their employment has probably followed the same procedure as in Baltimore, Md. There, we have required the merchant to provide himself with a legal measure for liquids and an approved scale for solids, and the theory is that the liquid measure conforming to our present national specifications, and the approved scale, would be used in determining the quantity of either the liquid or solid which would then be transferred into the paper container.

I say theory, because in practice I am quite sure most of us will agree that even though a merchant has the proper liquid measures and scales, he does not use them when employing paper measure-containers, but he does use the paper measure-container direct for the ascertainment of a quantity. This is a common practice in merchandising.

Digitized by Google

This being a fact, it would seem necessary that weights and measures officials should find a way to control their use as measures. How this shall be accomplished is not immediately apparent to your speaker. There are many ramifications involved and many conditions to be considered both as to the use of said paper measure-containers and the effect on the manufacturers of this article. Regulations for paper measure-containers for milk, cream, etc., seem to be covered in our milk-bottle specifications when that type of paper measure-container is used; and where the milk-bottle specifications are not applicable, regulations and specifications have already been suggested to the Conference Committee on Specifications and Tolerances.

To explain further the need of this regulation of paper measure-containers, may I invite your attention to the numerous samples which are here on display. You can readily see the different shapes, sizes, and designs that are now in common use. It is very evident from the many odd sizes in which these paper measure-containers are manufactured, that some simplification and standardization of sizes should be attempted; this, of course, should be done in cooperation with the paper measure-container industry.

It is suggested that if the Conference Committee on Specifications and Tolerances cannot handle this matter a special committee be appointed to study the paper measure-container and report back to this Conference at our next annual meeting with recommendations as to specifications and regulations for the use of paper measure-containers.

DISCUSSION OF ABOVE SUBJECT

Mr. McBRIDE. We have a law for the approval of containers if used for measures, which covers the quarts, pints, and half pints. The practical difficulty is that many of these things are eligible for use under the law which permits the sale of food in package form and the size of such container cannot be controlled if it is marked with its net contents. I think we have a very practical difficulty in regard to it; perhaps we can overcome that difficulty by framing a law to the effect that certain commodities must be sold by measure. That would seem to be the only avenue that would be open toward controlling sizes.

Mr. KANZER. A conference was held in New York City which we attended together with 15 or 20 paper manufacturers. The question arose as to whether containers made of paper and fiber do come under the regulation for the standard sizes. We took the position that they did. Immediately individual specifications were sent out for criticism and approval. The only criticism raised so far relates to the size of the markings on the containers.

ABSTRACTS OF STATE REPORTS[1]

ALABAMA

By H. S. HOLLOWAY,[2] *Chief, State Division of Weights and Measures*

Mr. Holloway stated that the inspections of vehicle scales made in the State by the National Bureau of Standards equipment had demonstrated the need of a heavier State-owned unit; this would probably be provided shortly. He mentioned that many small independent coal mines did not own scales and were not complying with the State law,

[1] For convenience of reference these reports have been assembled and arranged in alphabetical order.
[2] This report was read to the Conference by E. W. Pinnell, State Inspector of Weights and Measures.

Digitized by Google

although some steps had been taken which had improved the situation somewhat.

CALIFORNIA

By C. E. Tucker, *Chief, State Division of Weights and Measures*

Mr. Tucker noted the continued growth of weights and measures activities in the State and stressed several changes made in the State law. A gasoline and oil substitution act was adopted. A very constructive amendment to existing law involved the inclusion in civil service of all weights and measures officials; other amendments included a new legal definition for a deceptive container, and the strengthening of the public weighmaster act.

CONNECTICUT

By C. L. Klocker, *State Inspector of Weights and Measures*

Mr. Klocker noted the increase to five in the number of sealers of weights and measures employed by the State government. A new law requires wholesale sales of petroleum products by vehicle-tank compartment or by meter. Important new apparatus procured included a large-capacity scale-testing equipment and a truck upon which are mounted two 500-gallon tanks designed for the test of large-capacity bulk meters and vehicle-tank meters.

DISTRICT OF COLUMBIA

By George M. Roberts, *Superintendent of Weights, Measures, and Markets*

Mr. Roberts reported a substantial increase in appropriations for the coming fiscal year to take care of present work together with a new appropriation to enable his department to determine the quality of gasoline and lubricating oils sold. He described difficulties encountered with truckers who brought in coal from the mines for direct sale to consumers and the steps taken and contemplated to control this situation.

FLORIDA

By Howard E. Crawford, *Inspector of Weights and Measures, City of Jacksonville*

Mr. Crawford reported that there had been no change in State weights and measures laws; the work done by the State was largely confined to the test of gasoline pumps. Referring to Jacksonville, he stated that special attention had been given to the elimination of the sale of packaged goods not marked with their contents or short in weight or measure, sometimes as much as 25 percent.

GEORGIA

By S. H. Wilson, *State Oil Chemist*

Mr. Wilson reported that there had been no opportunity to enact any general State weights and measures legislation since no regular session of the legislature had been held in the last year. However, at a session devoted to State reorganization, the gasoline inspection work had been transferred from the jurisdiction of the Comptroller General to that of the Department of Revenue.

Digitized by Google

IDAHO

By FRANK L. HAMMON, *Director, State Bureau of Weights and Measures*

Mr. Hammon reported the acquisition by his bureau of an adequate large-capacity scale-testing equipment which had proved to be very satisfactory. He noted that requests had been received for demonstrations and tests outside the State; one large sugar company operating in Idaho and adjoining States had offered a large fee if the State Bureau would undertake to test their large-capacity scales located in adjoining States.

ILLINOIS

By JOHN J. LEVITT, *Superintendent, State Division of Standards*

Mr. Levitt reported that experience had demonstrated the economy and efficiency of the large-capacity scale-testing equipment procured by the State 2 years before; this had been found satisfactory in every respect. He stressed the fact that tests could be made expeditiously, the average time per test being less than 25 minutes. The weights, and the industrial truck used as a standard weight, had been found to be very constant.

INDIANA

By ROLLIN E. MEEK, *Chief, State Bureau of Weights and Measures*

Mr. Meek reported that Indiana had kept pace with the Conference by adopting all codes of specifications and tolerances and amendments thereto, so that the codes now in effect in the State were identical with those of the Conference; this had been found to be advantageous to proper supervision. He alluded to preparations which had been made to secure new and adequate general weights and measures legislation during the coming year.

MAINE

By JAMES A. BOYLE, *Sealer of Weights and Measures, City of Portland*

Mr. Boyle reported that Maine was obliged to operate under a very limited budget. However, it had been found possible to establish and equip nine test stations throughout the State with standards reasonably adequate for the testing of large liquid measures and meters. An effort had also been made by the State to see to it that local sealers were equipped with proper standards for general testing purposes.

MARYLAND

By S. T. GRIFFITH, *Chief, Division of Weights and Measures, City of Baltimore*

Mr. Griffith said that little progress had been made in State-wide weights and measures enforcement activities in many years. He reported a resolution passed by the legislature for the appointment of a committee to survey weights and measures conditions throughout the State and to report back to the legislature. However, since the resolution carried no funds to defray the expenses of the committee, the appointments had not been made.

MASSACHUSETTS

By JOHN P. MCBRIDE, *Director, State Division of Standards*

Mr. McBride said that in his State there could not be found any accumulation of false or condemned devices and expressed the opinion that when a law has been enforced for years any such accumulation

Digitized by Google

would be difficult to justify. He stressed the importance of the sale of fuel oil in his State and noted that the State equipment for the test of large-capacity meters, now included a 1,000-gallon test tank.

MICHIGAN

By Leo V. Card, *Director, State Bureau of Foods and Standards*

Mr. Card reported that State employees were about to be protected by the provisions of a strict civil-service law and that it was believed this would do much to strengthen the department. He also said that an additional large-capacity scale-testing equipment had been procured by the State and that shortly a portable outfit for testing vehicle-tank compartments and large-capacity meters would be put into service.

MISSOURI

By Louis G. Waldman, *Commissioner of Weights and Measures, City of St. Louis*

Mr. Waldman reported that he had put a model State law on the subject of weights and measures in the hands of the Governor, and that the latter had expressed the thought that some action might shortly be taken by the State in this connection. Mr. Waldman also said that the St. Louis department had been charged with the duty of supervising the quality of coal brought into the city for sale.

NEW JERSEY

By Joseph G. Rogers,[1] *Assistant State Superintendent of Weights and Measures*

Mr. Rogers reported the passage of new laws designed to regulate the sale of "bootleg" coal by requiring a certificate of origin and the licensing of vendors of coal; to regulate the sale of liquid fuels by providing in general that sales be made by meter; and to require the licensing of weights and measures equipment mechanics. He also mentioned a survey concerned with the proper methods of merchandising propane and butane.

NEW YORK

By Barnett Kanzer, *Director, State Bureau of Weights and Measures*

Mr. Kanzer reported that he had inaugurated a campaign toward the repeal of laws fixing weights per bushel since these were antiquated and unenforceable. He described efforts which were being carried on to solve the problem of shortages in packaged meats shipped from packers to retailers. He also stated that he was contacting various organizations in an attempt to coordinate efforts toward uniformity in various weights and measures endeavors.

NORTH CAROLINA

By C. D. Baucom, *State Superintendent of Weights and Measures*

Mr. Baucom reported that the State had procured equipment for testing electricity, gas, and water meters. This work was not to be in lieu of tests made by utility companies; no attempt was to be made to test all of these devices, but referee tests would be made

[1] Mr. Rogers made this report at the request of Charles C. Read, State Superintendent of Weights and Measures.

Digitized by Google

when the customer was not satisfied with the test made by a utility. He stated that a large-capacity scale-testing equipment would shortly be procured.[4]

NORTH DAKOTA

By A. J. JENSEN, *Chief State Inspector of Weights and Measures*

Mr. Jensen reported that confiscation of faulty apparatus was largely replacing criminal prosecutions and fines in his State with the result that considerable success was being obtained in the replacement of inadequate and obsolete apparatus by up-to-date devices. He also said that the State was negotiating for the purchase of two large-capacity scale-testing equipments each designed to carry 5,000 pounds of standard weights.

ANNOUNCEMENT

Mr. MCBRIDE. The Committee on Proposed Federal Legislation to Provide Assistance for the States in Administration of Weights and Measures Laws had a meeting last night but reached no final conclusion. We extend an invitation to all delegates who are interested in this subject to present themselves at an open committee meeting to be held in Parlor D, Washington Hotel, this evening. The meeting will be in session from 5:30 until 7:00 o'clock, and we will be glad to receive any of the delegates who have any ideas on the subject that might help the Committee in reaching a conclusion.

(At this point, at 1:11 p. m., the Conference took a recess until 2 p. m.)

[4] At the conclusion of his report, Mr. Baucom introduced Mr. Shankle, Chief of the State Gasoline and Oil Inspection Division, which division has been charged with the enforcement of all regulatory measures concerning the transportation, quality, and quantity of petroleum products. Mr. Shankle described the results obtained in the testing of measuring devices for these products.

Digitized by Google

FOURTH SESSION—AFTERNOON OF WEDNESDAY, JUNE 1, 1938

(The Conference reassembled at 2:24 p. m., John J. Levitt, Vice-President of the Conference, in the chair.)

ABSTRACTS OF STATE REPORTS—Continued

OHIO

By O. E. BRENNEMAN, *Chief Deputy Sealer, State Bureau of Weights and Measures*

Mr. Brenneman reported the passage of an act placing all weights and measures officials in the State under the provisions of the retirement law. He mentioned that as a start toward the adequate testing of large-capacity scales the State had procured an equipment carrying 5,000 pounds of 50-pound weights; he said this equipment was useful in reaching scales inaccessible to heavier equipments having facilities for mechanical handling of weights.

OREGON

By ARDEN A. REED, *Deputy State Sealer of Weights and Measures*

Mr. Reed reported on the method adopted to obtain State-wide inspection of weights and measures, a difficult problem since the area of the State is very great, and the agricultural industry, which ranks first in importance, is divided into several districts widely separated by mountain ranges. He said that for enforcement purposes the State was divided into four districts, each having one district sealer and such deputies as were necessary.

PENNSYLVANIA

By C. J. P. CULLEN, *Director, State Bureau of Standard Weights and Measures*

Mr. Cullen reported the passage of two laws: The first required the sale of all fruits and vegetables by weight except when in original standard containers, thus abolishing the use of dry measures, as a result of which 5,000 had been condemned in Philadelphia and Pittsburgh; the second required the weighing and proper branding of all coal mine cars, 90 percent of the cars weighed having been found to be incorrectly marked.

RHODE ISLAND

By EDWARD R. FISHER, *Chief, State Bureau of Weights and Measures*

Mr. Fisher expressed the appreciation of the State for the tests made on large-capacity scales by the National Bureau of Standards equipment; he hoped that the State would shortly procure facilities of its own to conduct such tests. He said that the law required that all vehicle tanks in use be tested and sealed by his bureau; because of the small area of the State this work could readily be done.

Digitized by Google

TENNESSEE

By TOM WEBB, *Sealer of Weights and Measures, City of Nashville*

Mr. Webb expressed appreciation to the National Bureau of Standards for its cooperation in furnishing its large-capacity scale-testing unit for work in Nashville. He expressed the hope that as a result his city might be able to procure a similar equipment next year.

TEXAS

By W. S. BUSSEY, *Chief, State Division of Weights and Measures*

Mr. Bussey reported a substantial increase in appropriations, resulting in increases in salaries and in additions to personnel and equipment. He cited difficulties encountered in relation to packaged goods, semisolid products often being so marked in terms of "ounces" that it could not be ascertained whether weight or volume was intended. It was hoped that through cooperation with the Federal authorities this situation could be cleared up.

VERMONT

By H. N. DAVIS, *Deputy State Commissioner of Weights and Measures*

Mr. Davis reported that the law recently passed requiring that persons selling or repairing used weighing and measuring apparatus be licensed, is working out satisfactorily. He said that the National Bureau of Standards large-capacity scale-testing unit had been well received in the State by both scale operators and the public and that the results had demonstrated the necessity of such an equipment for an intelligent test of such scales.

VIRGINIA

By J. H. MEEK, *Director, State Division of Markets*

Mr. Meek reported the advancement of weights and measures activities. The testing of scales had increased materially, a plan having been adopted whereby the State was making tests in various jurisdictions not having local sealers, compensation being received from these jurisdictions. Under a new law, compensation for State inspections requested by commercial agencies could be received when there was no local sealer to perform the service.

WEST VIRGINIA

By S. M. MILLER, *State Inspector of Weights and Measures*

Mr. Miller reported considerable difficulty, especially in the country districts, with old and badly worn commercial equipment; however, this apparatus—especially mine scales, other scales, and gasoline pumps—was rapidly being replaced. He mentioned that the National Bureau of Standards large-capacity scale-testing unit was conducting tests in the State at that time and was doing very fine work on scales which the State was not equipped to handle properly.

Digitized by Google

WISCONSIN

By GEORGE WARNER,[1] *Chief State Inspector of Weights and Measures*

Mr. Warner reported that a reorganization of State departments and commissions was in process. Although a complete report on this could not be given, it was contemplated that the weights and measures inspectional work would be consolidated with other such work in one bureau and that each inspector would do several kinds of inspectional work. It was thought that by this method such work could be done more efficiently and economically.

REPORTS OF REPRESENTATIVES OF STATE ASSOCIATIONS OF WEIGHTS AND MEASURES OFFICIALS

At this point brief reports of the activities of State associations were presented as follows:

California Sealers' Association, Charles M. Fuller, Sealer of Weights and Measures, Los Angeles County.

Indiana Association of Inspectors of Weights and Measures, Cleo C. Morgan, Sealer of Weights and Measures, city of Gary.

Massachusetts Association of Sealers of Weights and Measures, Walter W. Gleason, State Inspector of Standards.

Michigan Association of Weights and Measures Officials, George F. Austin, Jr., Supervising Inspector, Bureau of Weights and Measures, city of Detroit.

New Jersey Association of Weights and Measures, Charles C. Read, State Superintendent of Weights and Measures.

New York State Association of Sealers of Weights and Measures, R. D. Spencer, Sealer of Weights and Measures, Oneida County.

Pennsylvania Association of Inspectors of Weights and Measures, C. J. P. Cullen, Director, State Bureau of Standard Weights and Measures.

Texas Weights and Measures Association, R. L. Fullen, Chief, Division of Weights and Measures, city of Dallas.

Virginia Weights and Measures Association, B. W. Ragland, Chief, Bureau of Weights and Measures, city of Richmond.

GENERAL CONSIDERATION OF SUBJECTS OF INTEREST AND QUESTIONS BROUGHT UP FOR DISCUSSION BY OFFICIALS

The ACTING CHAIRMAN. We want every one to feel free to express his opinions on subjects brought up under this heading, because out of this discussion we all hope to get some very good information.

INTERSTATE SHIPMENTS OF INCORRECT USED APPARATUS

Mr. W. P. REED. Recently, I went to a salvage house that had been established a short time before in Atlanta and found 13 used scales in the place; all of them had to be condemned. I found that these came from Washington, D. C. and from Jacksonville, Fla. I told the proprietor that he would have to have them repaired so that they would pass inspection before he could sell them. He said, "What if I sell these to someone outside of the State?" I said, "If sold before they are corrected, I want to know where they go and wherever you ship

[1] This report was read to the Conference by Erwin J. Rogers, City Sealer of West Allis, Wis.

Digitized by Google

them I will notify that inspector." So he immediately had those scales repaired, and I approved them.

I think it would be a good policy if we would work more cooperatively with each other and when we know that scales such as the above are being shipped out of our States, we should notify the inspector of the State to which they are being shipped. I have not heard of that being done but I do intend to do it in regard to all scales that are shipped out of Atlanta.

Unfortunately, Georgia has become the dumping ground of incorrect scales, weights, and measures from States which have good laws. I have found that out in this instance cited above. I think if we cooperate and notify each other of such apparatus being shipped from one State to another, that we would soon stop that practice.

STANDARDIZATION OF PACKAGES

Mr. PISCIOTTA. The standardization of packages of commodities is a subject which deserves a great deal of thought not only from the point of view of protection to the consumer, in whose welfare we should be most vitally and primarily interested, but also that of the retail dealer and businessman himself.

At last year's Conference, George Warner, of Wisconsin, delivered a very interesting paper on the standardization of packages of canned goods. Mr. Warner's paper dealt with the subject of metal cans in standard dimensions for each capacity. Certain specified capacities in terms of standard liquid measure were the only ones to be permitted. I am sorry I was unable to attend the hearing and register in favor of this bill. This was certainly a big step in the proper direction.

A proposed law for the city of New York deals with the standardization of packages and containers of certain specified staple commodities commonly and usually sold by avoirdupois weight. Weights and measures officials have for many years tried to educate the consumer to buy in terms of weight, measure, or numerical count. They have tried to discourage the buying of "ten cents worth" or a "quarter's worth." We have tried to make it the usual thing for a purchaser to obtain correct weight. Much legislation has been put into effect in many States, and local jurisdictions, and through the U. S. Food and Drug Act in the entire country, relative to the marking of the net contents on containers. All of these are fine—all are necessary. However, a new method of cheating the consumer—because that's what it really is—is rapidly developing. To bring this to the attention of the weights and measures officials in all jurisdictions is the purpose of this discussion.

For generations common staple commodities have been purchased by our mothers and grandmothers by the pound. Business methods are changing now and with the growth of chain stores, self-service stores, and the packaging of food products in general, the sale of commodities which are weighed by the retailer is fast disappearing and the sale by package is becoming the vogue. Competition is very keen in this class of business and has resulted in unfair practices and in all sorts of misleading and deceptive packages, all at the expense of the consumer.

For example, coffee has always been bought by the pound; everybody asks for a "pound" of coffee, or in some cases, for "½ pound." Through competition, in trying to meet or to beat the price of the other

Digitized by Google

fellow, what do we find? I have here a 7-ounce package, an 8-ounce can, a 13-ounce can, a 14-ounce can, a 15-ounce can, and a 16-ounce can of coffee. There is no more justification for the packing of coffee in these odd sizes than there is for the packing of tea in a 3-, 3½-, or 7-ounce package. Yet this is being done also. I have these two packages [indicating], which look practically alike when you put them by each other. Now, you will be surprised to learn that while they look alike, one is slightly larger than the other, and if you examine them you will find that the smaller one contains 16 ounces and the larger one, which is not packed tight, contains only 14 ounces of coffee.

I think something should be done to protect the consumer. It is all within the law, because the package is correctly marked with the net contents, but we know that the housewife rarely looks at the marking on the label and often does not even know how many ounces there are in a pound. Certainly many housewives do not know whether 3½ ounces equal a quarter of a pound or not. Many of the retailers who sell these products every day do not know that these packages do not contain a pound and seem very much surprised when we tell them. Where this practice will stop no one knows, unless something is definitely done about it right now to stop it.

Inspectors from my office can go into almost any grocery or delicatessen store in New York City and ask for 1 pound of any of these brands of coffee or ½ pound of a certain brand of tea and the shopkeeper will invariably hand them one of these packages with no explanation (and often with no knowledge) that the quantity is not as requested.

To show you how the packers of these commodities try to evade putting up their products in proper size packages, I wish to give you the following illustration: I called in the manufacturers of several brands of coffee which were being packed in these odd-size containers. They tried to convince me that it was impossible to obtain from the can manufacturer a can even a fraction of an inch higher than the one they were using, claiming that such a can would collapse and that therefore vacuum-packed coffee was physically restricted to a 15-ounce or smaller can. As I was rather skeptical, I called in the leading can manufacturers, and in order to protect their customers, I suppose, they told me the same thing. But they did not know that I had made a separate investigation in the meantime and had procured a can which was higher and which would contain a full pound. This can, incidentally, was made by one of the same manufacturers who tried to persuade me that it could not be done. When they were confronted with the evidence they had to admit that they can manufacture almost any size can ordered but that they can only sell what their customers specify.

In the packaging of dried peas, beans, rice, etc., the wholesalers who put these up argue that they purchase millions of containers of a standard size and use the same package for different kinds of commodities. They claim that a standard-size box will contain a full pound of yellow split peas but only 15 ounces of green split peas and 14 ounces of lima beans, etc. By using only this standard-size box and purchasing them in very large quantities, they argue there is a great saving which is passed on to the consumer.

I have samples of the same size box containing the same commodity and the three boxes indicate different weights. This shows that their

Digitized by Google

argument is absolutely false. As a matter of fact, one concern uses the same size box and puts a pound of rice in one, 15 ounces in another, and only 14 ounces in another. Perhaps this concern would say these are three different kinds of rice, but I have with me here these same kinds put up by competitors who manage to get all the different kinds in 1-pound packages of the same size.

Let me show you a notice [2] that is being sent out by a large distributor to the retailer, which will indicate the trend of thought in this "modern merchandising." Of course, this particular notice refers to pound packages only, but I suppose they have a similar notice for the odd-size packages.

I have with me a number of standard-size boxes of different large distributors grouped together by commodity to show you the variation in the way these are packed. The following schedule shows these variations:

Variation in labeled weights of comparative packages

Commodity	Net contents in ounces, as put up by distributor—					
	A	B	C	D	E	F
Green split peas	15	16	16	16	16	16
Pea beans	14½	[a] 14 / [a] 16	16	16	16	16
Red kidney beans	14½	13	16	16	16	16
Lentils	16	16	16	16	16	16
Barley	14½	16	16	16	16	16
Marrow beans	14½	13	16	16	15	16
Farina	13	[b]	16	14	14	14
Yellow split peas	16	16	16	16	16	16
Lima beans	14	13	[b]	16	14	16

[a] Two different weights—identical packages.
[b] Does not pack this commodity in a comparative package.

To the customer, all of these boxes look alike—they seem to be the same size. In fact, the smaller looking box often contains the larger quantity.

I have packages of rice in capacities of 12, 14, 15, and 16 ounces. These must be very confusing to the purchaser, particularly when one distributor, as I said before, puts three different quantities in what looks to be the same size box.

Here are two boxes of zwieback [indicating] made by competing concerns; both packages look to be about the same size, but one is marked 6 ounces and the other 5¾ ounces. Look at these boxes of prepared cereal [indicating]; both are the same size, but one is marked 10 ounces and one is marked 9 ounces. A good example of what is being done is these two packages of soap powder [indicating]. They appear to be the same package, but one is marked 19 ounces and the

[1] The notice referred to is as follows:

CAUTION

Mr. Retailer:

These packages contained ONE FULL POUND when packed. But due to a natural shrinkage, they may not weigh a pound now.

Offer them to customers BY THE PACKAGE, not by the pound—otherwise you may be subject to a fine for misrepresentation.

DISTRIBUTOR, Inc.

Digitized by Google

other 21 ounces. Actually, upon measurement, one is larger than the other, but the purchaser could never tell the difference unless they were shown together. You can see, therefore, that all the alibis and explanations are merely excuses. It is a question of continually fooling the public—and making the housewife think she is getting a bargain when she is paying just as much or more for a lesser quantity.

For centuries, spaghetti and macaroni have been sold only by the pound. Competition became very keen when, instead of being sold loose, this commodity was put up in packages. One firm came out with a 15-ounce package, although until it did so, all manufacturers, without any exception, were packing a full pound. Another firm found this competition was interfering with its business and decided to go one better, so it put out a 14-ounce package. The packages were so similar in construction, design, and label that for a long time, even the dealers who were selling them were offering them as 1-pound boxes. When I called in the distributors and wholesalers, they produced bills and accounts showing that they were selling them to the merchants and billing them for so many pound boxes, although for 6 months the package had been reduced to 14 ounces.

One of the most common practices of this kind is the packing of sliced bacon in 3- and 6-ounce packages which are readily sold for a quarter or a half pound. At a conference of the packers of this commodity, they agreed to discontinue this and to a large extent we have eliminated this practice in New York City. There was no law compelling them to do this, but they voluntarily agreed to do it. However, we still find some brands packing a 3- and 6-ounce size.

Our city has a large Jewish population, and the sale of matzos, particularly at the Passover season, is very large. Formerly, this was put up in 5-pound packages. Through progressive reduction in quantity for some years, due to strong competition, the quantity had shrunk to 4 pounds 9 ounces and was so marked on the container, although the trade still called them "fives" and billed them as 5 pounds at so much per pound, or sometimes as five "units" at so much per unit. This Department has been trying to break up this practice for a long time, so last year, during the holiday season, my inspectors made a drive on the small retailer. So general was their opinion and so deficient was their knowledge as to the actual contents of matzo packages, that we were able to obtain over 1,100 violations in 1 week just by going into small retail stores and asking for 5 pounds of matzos. It is no wonder that the shopkeeper and consumer were confused—here [indicating] are two packages of matzo meal. They are the same size, yet one contains 14 ounces and the other, 1 pound. When the retailer protested that it was the manufacturer's fault, we advised him to complain to the manufacturer. This was successfully accomplished at considerable expense to the packer, and the result was that this year the packages contained 5 pounds.

Another thing I would like to bring before this Conference is the fact that the net contents is not marked on containers of smoking tobacco. The tobacco people claim that the revenue stamp is a label which complies with the requirements as to marking the contents. The brewers claim just the opposite; they argue very forcefully that the revenue stamp indicates the quantity of beer on which they have paid the tax and is not to be taken as an indication of the actual contents. Here are two large businesses operating under the same Federal law with two directly opposite arguments.

Digitized by Google

With all the fancy labels on a can of tobacco, I fail to see why everything is included except the net contents. I have included a provision to this end in this local law.

I am including in my proposed law a provision also that ice cream be sold by avoirdupois weight only in specified size containers.

I have brought with me for distribution, copies of the proposed law which I have prepared for New York City, and although I understand fully that it will meet with opposition, I feel confident of its passage. Organizations of retail grocery and delicatessen stores are supporting this measure and are anxious for its adoption. They do not want to be confused any longer. The legitimate dealer wants to give 16 ounces to the pound and he deplores this practice of odd weights.

I have extra copies of this proposed law. Before its introduction it may be revised to meet criticism and opposition. I would appreciate any suggestions from any one at this conference so that I may have the benefit of your reaction to this measure. You will notice that all commodities are not included. That is because I want to pave the way with these items, and if we are successful in having these commodities packed in standard containers, others will subsequently follow.

I want to take this opportunity to express to Mr. Holbrook and the staff of the National Bureau of Standards our very great appreciation of their help and cooperation that we have received. I feel that we have been very fortunate in getting all the information we sought. I feel that as a result of these conferences of weights and measures our work has become much easier. I receive almost daily correspondence from officials in all parts of the country. I correspond steadily with them. We feel that the correspondence and the meeting in these conferences of the weights and measures officials from all parts of the country are of great benefit to all of us, and at any time you think we can be of any assistance to you, I want you to feel free to write us and we will do what we can to help you.

Mr. BOYLE. I have found that inaccuracy exists between advertised weights and distributed weights and that they sometimes differ by an ounce or more. The independent grocers may order things in certain sizes and when they come the items may be in a smaller size. There is no doubt in my mind but that they are misrepresented. On one occasion I wanted to get some cod-liver oil, and when I asked the price I was told that it was 87 cents a pint. I said I did not want such a large quantity, and then I was told that a half pint was 47 cents. I paid for a half a pint and when I got home I saw that it was marked very plainly "6 ounces." The larger bottle was marked "16 ounces."

Mr. BODENWEISER. Mr. Chairman, I would like to ask a question of Mr. Fuller of California. Millions of packages of raisins, apricots, and other dried fruits are sent out throughout the United States from California and they used to be marked "one pound." Now these packages are marked "11 ounces" and "15 ounces", although in many cases the packages are the same size as before. I wonder if you could give us any reason for that?

Mr. FULLER. I presume that when there was an increase in price, instead of raising the price per package they packed a smaller amount in the package and labeled it that way. Of course, under the present law it is legal to do it.

Mr. BODENWEISER. Our State superintendent of weights and measures is empowered to make regulations under our State law. I

Digitized by Google

am wondering if it would not be possible under that power to make regulations in respect to the contents of the packages to take care of that situation. If we wait for the Federal Government to rectify this I think most of us will be buried before it will be done. Considering what the gentleman from New York City stated to us, things are getting worse instead of better. Packages are marked 15 ounces which were formerly 16 ounces; supposedly "8-ounce" packages hold 6½ ounces or less. You can find candy in "2-pound" boxes holding only 1 pound with a layer underneath that is absolutely empty.

I have two packages of dried fruit here [indicating]. One is marked 12 ounces, one 10 ounces. If you put the two of them together you will find that they are exactly the same size. The public is being deceived.

Mr. RAGLAND. Mr. Chairman, this is a matter of very great importance. I endorse what my friend from New York has said. I have been trying for many years to have a stop put to these practices. But I have been saying to the housewives that containers should be properly marked. That is important. But size is more difficult to regulate. When one buys a can of coffee, it depends on the grind of that coffee and its handling whether the can is full or not full. Now, in that connection is it wise to make a concern make different sizes of cans for different grades and grinds of coffee because some of the packages will not be full? I am more interested in the net weight at the time of the delivery to the customer so that the customer gets a pound for every pound he is supposed to have. We insist on actual net weight of 16 ounces to the pound at the time of the delivery.

Mr. PISCIOTTA. Mr. President, in New York we have a State law requiring packages to be marked and as long as they are marked nothing can be done to require standard sizes directly. But indirectly we have had many manufacturers comply in this way: Our inspectors go in a store, name a certain brand of product, and ask for 1 pound of that product. The merchant takes a package off the shelf and does not know or does not care about the marking. Thus we often get short measure. We then give a summons. Now, you must understand that we are not trying to make trouble for the poor merchant, but through him we compel the manufacturer to comply. Little dealers all over the city complain to the manufacturer of his faulty packages which are giving them trouble; if he wants to keep their trade he must give them pound or half-pound sizes, otherwise they will not handle it. As a result, without having any right to compel the manufacturers to do it, in that manner it is possible to force the manufacturers to put their goods on the pound or half-pound basis. We did it with spaghetti and macaroni.

Mr. TUCKER. California is very much in sympathy with the presentation made. We have endeavored to have passed what is known as the slack-fill act, but our wings were clipped at the last session. We found upon investigation that only four States had a slack-fill act. We will endeavor to correct that evil brought out—if it is considered an evil—on our return to California.

The ACTING CHAIRMAN. The purpose of this discussion today is to get together on some sort of a standardization bill. I think our friend from New Jersey is a little hard on the United States Government by suggesting it is entirely a Federal problem. The purpose of these conferences is for us to bring out these different ideas and to agree among ourselves on what we want. I know that the National Bureau of

Digitized by Google

Standards will do everything it can to help in this work, but until we know what we want, they cannot very well take action on it.

Mr. BAUCOM. Mr. Chairman, I believe that in North Carolina we are in a little better position than most of the States under our act. This covers everything sold, requires that any commodity in package form shall have the weight plainly and conspicuously marked thereon on the outside, and then empowers the Department of Agriculture to make rules and regulations. However, we run into the interstate commerce on that and that is where we have difficulty. I believe that the several departments should stipulate that the weight must be plain and conspicuous. Now, if we could get marks on the package which are actually plain and conspicuous—whether 14 ounces or whatever it was—we could get somewhere.

Now, there is one thing, however, that I do do. If I find that short-weight original packages are coming into our State, why we tell the merchant that if he sells these he does it with full knowledge that they are short and then we will prosecute him. Then he either sends them back or proceeds to make some adjustment about it. That seems to me to be about the only way in which we can get back at somebody who is shipping in from out of the State. I also write to the official in the jurisdiction from which the packages come and tell him I found certain packs short or improperly labeled. That official has the power to step in and stop that manufacturer and he does that. I remember one instance where I had some stuff coming in from Richmond. I wrote Mr. Ragland and within 24 hours they had it properly marked. We have the regulations and the law to take care of all trouble arising inside the State.

Mr. FULLEN. Mr. Chairman, we had a case in Texas that was based on the shipment of sauerkraut from New York State. Those cans were labeled 15½ ounces; they held approximately 13½ ounces. We held up 37,000 cans and we got $75 of New York money down in the city of Dallas. They claimed that there had been a mistake made in handling the labels. Competitive cans were marked 13½ ounces and held approximately 14 ounces when filled.

We have found 12 national distributors of food products putting out semisolid products labeled in ounces without specifying whether liquid measure or weight was meant.

Mr. GRIFFITH. There is no doubt in my mind that this problem of deceptive packages is one of the vital problems of every weights and measures official. There is a presumption of fraud. The Federal Government itself for over a decade has been struggling under the U. S. Food and Drug Act trying to do just what New York City is now attempting. I do hope that New York can put it over; it would be an entering wedge for the various States to follow suit.

We all know that when a commodity package is correctly marked with the weight or measure of its contents we haven't anything to do with the package other than that. Now, when we step into the picture and try to regulate the size, shape, or contents of the package itself, we are traveling down the same road the food and drug people have been traveling for many years. I know the tremendous pressure that has been brought to bear upon Congress by manufacturers who have unlimited funds. When they find that they can sell 15 ounces for as much as 16 ounces, thus making 16⅔ percent before the product moves out of their plant, they are going to try to continue to do that. Thus there is a tremendous opposition to the regulation of packages.

Digitized by Google

I will do anything that is possible for me to do to assist New York City in getting its bill through by supplying them with exhibits, examples, and specific cases.

In Baltimore we too had our attention called to dereliction on the part of a number of our manufacturers. It has not been more than 6 weeks since a New Jersey man wrote to us in regard to a local firm putting out certain packages not properly marked or not marked at all. We endeavored to cooperate and I believe we did get that straightened out. We are very vitally interested in full weight at all times.

Mr. MORGAN. You will find that bar soap varies in size. I notice that a leading manufacturer puts out the same kind of soap in bars of two sizes, differing in weight by 2 ounces. If you do not see the two together you will not notice the difference. Because merchants were complaining I checked up as to the soap that was being put out by the chain stores on special sales and I found that the soap was 2 ounces lighter than presumably the regular soap sold on regular days.

Mr. MCBRIDE. I want to compliment Mr. Pisciotta for the effort he put into this problem. He has undoubtedly developed this subject after a great deal of work in the city of New York and he has made a survey which has proven very interesting. I think the subject is a very broad one and the effort is worth while and merits success.

I would like to offer a motion that a committee be appointed to look into the matter of remedying this situation and to determine which way may be best adapted to accomplish that purpose.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. Before we close this discussion on the standardization of packages and the necessity of a Federal law, I think it would be well for the Conference to recall that there is already a bill before Congress in relation to canned fruits, vegetables, and milk.

You will remember that last year George Warner, of Wisconsin, had a very interesting exhibit, and that he and Congressman Sauthoff, of Wisconsin, talked before this body, the latter having introduced a bill which the former sponsored. Some 2 or 3 months ago that bill—H. R. 6964—came up for hearing before the Committee on Coinage, Weights, and Measures of the House of Representatives and at this hearing, which lasted 2 full days, Mr. Warner and others valiantly attempted to get a favorable report. In view of this, I asked Mr. Warner to follow up this subject at the present Conference. Unfortunately, he was unable to be here, but he has sent in a prepared statement which I think should be read at this time. Mr. Warner says [reading]:

The Twenty-seventh National Conference on Weights and Measures last year endorsed H. R. 6964, and I wish to thank the members of the Conference who so ably and generously gave of their time and talent in writing and contacting members of the Committee on Coinage, Weights, and Measures and their various congressional representatives. I would suggest to the members of this, the Twenty-eighth National Conference, who have not already done so, to write to the Committee on Coinage, Weights, and Measures, House of Representatives, and endorse the principle of bill H. R. 6964.

The Committee on Coinage, Weights, and Measures held a hearing on this bill on March 15 and 16, 1938, and the writer, representing the Agricultural Board of Wisconsin, appeared in favor of the bill.

Digitized by Google

I believe that the Conference is quite familiar with the provisions of the bill which in short would standardize cans for fruits and vegetables and canned milk and would outlaw about 60 odd-sized cans for fruits and vegetables that are now on the market. This is our first opportunity to analyze the opposition to the bill; heretofore we have heard only favorable comment in regard to the principle of the bill; now, however, we have an opportunity to meet the objections offered by the opposition to the bill.

With the verbiage eliminated, the hearing brought out two opposing views: Standardization of fruit and vegetable and evaporated milk cans was not openly opposed, but whether it was to be accomplished by voluntary cooperation or made mandatory by Federal law was really the question at issue. No justification for a large number of cans with only 1 or 2 ounces difference in capacity was given by the opposition to the bill.

It was clearly established that under present conditions there is no way to compel the discontinuing of the use of cans that a voluntary committee recommends be discontinued; in fact, there is evidence to show that some cans that were eliminated in recent years died a natural death because the dealer could not sell them. The satellites around some of the others increased greatly, and for that reason more different capacity cans are continually coming on the market. Five or six groups making cans have not voluntarily agreed to make only certain sized cans, and the more than 3,000 canners themselves cannot agree on any certain set of can sizes, therefore voluntary agreements in this group seem impossible. On the other side of the picture all consumer groups represented at the hearing were agreed that can sizes should be on the basis of liquid measure and in a limited number of sizes.

The picture is a little different in the case of cans for evaporated milk. It is not contended that there are too many cans now used for evaporated milk, but the bill would make the cans a little larger than they are at present. You will recall that the family size can for evaporated milk formerly held 16 ounces avoirdupois, and that it was reduced to 14½ ounces avoirdupois in about 1931. The present bill would increase the size of this can to 1 pint, which would be approximately the same size as the can used prior to 1931. The 6-ounce avoirdupois can would be increased in size to a half-pint liquid measure. The reason given at the hearing for cutting the size of the 16-ounce avoirdupois can to 14½ ounces was to hold the retail price to 10 cents or under; however, when the price of milk dropped, the can size was not increased. I wonder if anyone would want a short quart of fluid milk delivered to his door when the price of milk went up, or a large quart when the price went down.

The opposition to the bill relating to fruits and vegetables would have us believe that cans are made to fit the product instead of the product being prepared to fit the can. If the former were true, we would have the cans changed with the seasons, and if that were true, why would it be necessary to have a change in prices yearly? Before the advent of weight laws standardizing loaves of bread, it was the bakers' practice to juggle the weight and not the price, because price is easily apparent to the purchaser but weight is not. Apparently, the opposition to this bill want to juggle both the weight and the price.

I believe that if the weights and measures officials in their various jurisdictions would contact the individual canners and enlist their aid in making known their wishes to the Committee on Coinage, Weights, and Measures, it would materially assist that committee in properly recommending the bill to Congress for passage.

I may say that Mr. Warner has supplied a number of copies of the statement and they are on my desk for those who desire them.

Mr. CARD. I would like to say a few words about mandatory inspection. We have just completed a year of mandatory inspection, with the cooperation of the Federal department, on approximately 5,000,000 bushels of potatoes. We have supplied probably more than 5 percent of all of the potatoes going into commercial channels in the year. Now, we believe you must have unified effort between the Federal and the State departments, and I will give you a specific example of what that will accomplish. About 4 weeks ago I had some conversation with officials of the Department of Agriculture in Washington relative to the movement out of Michigan of sweet potatoes. It has been the practice in Michigan to move sweet potatoes labeled with a tag to the effect that they were certified;

Digitized by Google

under our existing mandatory code we forbid the use of these tags. We found in some cases that the dealers conceived the idea of mailing the tags and putting them on at destination. I took it up with the Department of Agriculture and in less than a week I had it straightened out, and eliminated all that trouble. As I say, if you are getting any shipments that you do not think are up to standard, notify us and we will stop them at once. All the potatoes sold out of Michigan are sold by weight.

Mr. DEVRIES. Mr. Chairman, we have packages such as spaghetti and potatoes coming on the market at so many pounds or ounces "when packed." Now, I would like to know if any of the States recognize that marking. You find shortages in these packages and it does confuse the person buying them. It gives the storekeeper a chance to say that there was full weight in there when it was packed.

Mr. GRIFFITH. Mr. Chairman, I would like to say that the question the gentleman just propounded is largely controlled by the State net-weight law. In Baltimore the law says that the commodity shall be sold by net weight. The Appellate Court has construed it to mean net weight at the time that the sale is made.

Mr. DAVIS. Last week I had a can marked "one United States gallon," which was 16 cubic inches oversize. The result of that is that when 1 gallon is placed in the can there is an air space on top. In the case of maple syrup such an air space will have a tendency to make the syrup crystallize in the can. We have encountered maple syrup put up in cans holding not more than 221 cubic inches that presumably should hold a gallon. This matter of standardization is very important in regard to the handling of maple products; unless the can is standard all kinds of difficulties arise.

(At this point, at 5:15 p. m., the Conference adjourned to meet at 10 a. m., Thursday, June 2, 1938.)

SECRETARY'S NOTE.—On the evening of Wednesday, June 1, 1938, a get-together entertainment session was held in the ballroom of the Washington Hotel for the delegates and visitors and their families. Motion-picture films "Precisely So," "Materials," and "A Coach for Cinderella" were shown by courtesy of the Chevrolet Motor Division of General Motors.

Light refreshments were served, and dancing was enjoyed.

Digitized by Google

FIFTH SESSION—MORNING OF THURSDAY, JUNE 2, 1938

(The Conference reassembled at 10:10 a. m., at the National Bureau of Standards, Dr. Lyman J. Briggs, President of the Conference, in the chair.)

TWO-DRAFT WEIGHING OF MOTOR-VEHICLE LOADS

By C. L. RICHARD, *National Bureau of Standards*

(NOTE.—The following address was illustrated in part by demonstrations with small models of motor vehicles and with accessory apparatus, in combination with a scale. These demonstrations, in general, were of the same character as those which had formerly been made in the laboratory and which are reported upon in the paper as demonstrations I, II, III, and IV, and they showed the same character of results as those reported upon.)

The weighing of motor vehicles in two drafts, or "two-draft weighing" as the practice may be called, is an expedient which is commonly adopted when the wheel base of the vehicle to be weighed exceeds the platform length of the scale to be used. Fundamentally, the practice consists in weighing individual or combination axle loads, adding the results, and accepting their sum as the total weight of the vehicle.

As a convenient method for weighing materials in transit, the practice has found widespread adoption and is of increasing prevalence. This is an inevitable consequence of some developments which have characterized growth of the motor-transport industry during the past 2 decades. The consistent trend toward the use of longer wheel base trucks, and the increasing use of tractor-trailer combinations have combined to place in modern traffic many vehicles which cannot be accommodated on the platforms of many of the vehicle scales in service. To judge from experience with comparable conditions in the past history of rail-transport weighing, when for more than 50 years the primary problem was to provide track scales of sufficient length to accommodate rolling stock of constantly increasing lengths, there seems to be little probability that the current situation, respecting the inadequacy of motortruck scale lengths, may find early remedy. Rather, it may be anticipated that continuing development and expansion of motor transportation will increasingly create occasion, if not necessity, for resort to the two-draft method of weighing vehicles. This statement is made with due regard for the limitations which various jurisdictions have imposed on vehicle lengths, wheel loads, etc.; the dual-wheel and tandem-axle features of modern motortrucks and the adoption of trailer or semitrailer principles illustrate how readily the motor-transport industry may adapt itself to the requirements of imposed regulations.

It is in order, therefore, to consider critically this two-draft method of weighing vehicles, to investigate its potentialities and limitations, and to determine whether or not, as a method of weight determination, it conforms to accepted standards of dependability. To do so will be the purpose of the ensuing discussion.

As a basic premise upon which discussion may be founded it will be said that, within the limits of its capacity and sensitiveness, a modern

123202—39——6

Digitized by Google

motortruck scale of proven accuracy may be expected to indicate correctly the weight of a two-axle motortruck when both axle loads are on the scale platform; also, it may be expected to indicate with considerable accuracy the weight of each axle load placed on the platform. However—and this is the important consideration—if a portion of the weight on either axle shifts to the other axle during the weighing procedure, it follows that the value derived by adding the two indicated weight values will not be the true weight of the entire vehicle. That is to say, weighing the individual axle loads of a vehicle, adding the results, and assuming that their sum truly represents the weight of the whole, presupposes that the load on each axle remains constant during the entire weighing procedure. This latter condition, as will be shown presently, is one which obtains only under certain favorable and rather uncommon circumstances.

It follows from the foregoing that investigation of the subject and search for potential sources of error in the practice of two-draft weigh-

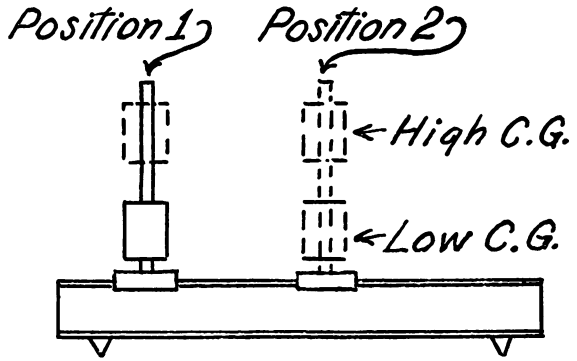


FIGURE 3.

ing should focus not on the scale proper but on elements or factors external to it. These may be (1) the gradient or level of the scale approaches upon which one axle load may rest while the other is being weighed; (2) the vehicle or vehicle combination and certain component parts of either; (3) the nature and distribution of the load; and (4) accidental or other shifts of load forces.

Study of the manner and degree in which these various factors may cause error in the two-draft weighing of an actual motor vehicle was carried on in part by theoretical analysis and in part by laboratory experiment with small simplified models of motor vehicles. It should be understood that although the conclusions developed by theoretical analysis apply generally to actual motor vehicles, the results of the experiments conducted with the vehicle models may not be so directly applied; they should, in the absence of corroboratory evidence obtained by experiment with actual vehicles, be interpreted in a general qualitative sense rather than in a quantitative one.

The first factor to be considered is that of scale approaches which are not in the plane of the scale platform. This is a condition very frequently encountered in weighing motor vehicles, the approaches either sloping upward to the scale platform level or being somewhat below that level. (Instances where either or both of the approaches lie above the level of the scale platform are relatively infrequent and

Digitized by Google

will be disregarded in this discussion except to state that the effects of such conditions would be opposite to those introduced by the usual low approach conditions.)

Figure 3 illustrates a model employed in experimental study of the effects which may be introduced by low scale approaches. It consists of a simple beam of light weight, fitted with knife-edge supports near its ends, to the upper flange of which may be clamped, at any position, a threaded rod which carries a vertically adjustable mass. (In essential respects the model embodies the elementary features of a two-axle motortruck, the beam representing the chassis and body, the knife-edges representing the axles, and the detachable material representing a load of variable height and location.) By mathematical analysis it can readily be demonstrated that the weight of any rigid system, illustrated by the model, is equal to the sum of the normal reactions at the supports, and that the normal reactions change as either support is raised or lowered; if the angle which the beam makes with the horizontal is small, then the amount of this change is proportional directly to (1) the weight of the system, (2) the height of

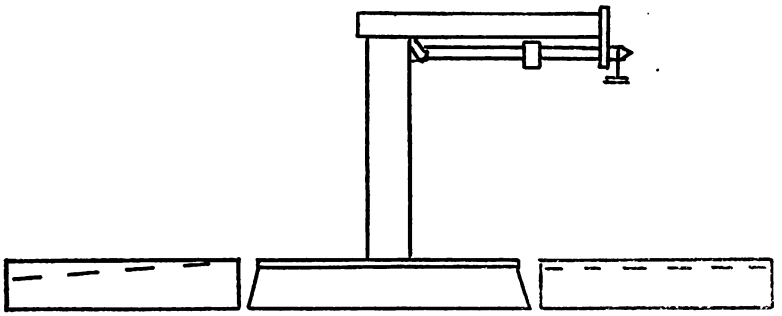


FIGURE 4.

the center of gravity above the plane of support, and (3) the vertical distance through which either support is raised or lowered, and is proportional inversely to the square of the distance between the supports.

Some of the principles just stated may be demonstrated experimentally with the model of figure 3 and with the weighing scale of figure 4. It will be seen that the model is too long to be accommodated on the platform of the weighing scale. However, if the right-end support of the model is placed on the scale platform and its left support on an approach level with the scale platform (illustrated by full line), the normal reaction at the right end may be measured by the scale indication. The normal reaction at the left end may then be measured under similar conditions, and the sum of the two indications will correctly represent the weight of the system. If now the approaches are modified to lie below the scale platform level (illustrated by broken lines) and the weighings repeated, the indicated value of each reaction will be found to have changed and the sum of the indications to be less than the true weight of the model. The amount of change, as previously stated, will be proportional to the amount by which the approaches lie below the scale platform level.

The results of some experimental determinations made in the laboratory with this apparatus are reported below as demonstration I.

Digitized by Google

In these, and in most of the later experiments, for simplicity of manipulation, inclined approaches were not used, but "low" approaches, level but in a plane below that of the scale platform, were utilized, as shown by the broken line at the right of figure 4. The true weights of the beam employed, when unloaded and when loaded, were separately determined to be 4.77 and 9.62 pounds, respectively. In the tabular results, "Position 1" and "Position 2" designate two different positions of the load—that is, of the threaded rod and its vertically adjustable mass—with respect to the knife-edge supports of the beam.

DEMONSTRATION I.—REACTION CHANGES CAUSED BY CHANGES IN PLANE OF SUPPORTS

1. Beam unloaded.

   a. Approaches level with scale platform.

Left-end reaction	2.58 lb.	
Right-end reaction	2.19 lb.	
	4.77 lb.	True weight of beam.

   b. Approaches ½ inch below plane of scale platform.

Left-end reaction	2.57 lb.	
Right-end reaction	2.18 lb.	
	4.75 lb.	Apparent weight of beam. Error −0.02 lb, or −0.4 percent.

2. Beam loaded, position 1, low center of gravity.

   a. Approaches level with scale platform.

Left-end reaction	6.13 lb.	
Right-end reaction	3.49 lb.	
	9.62 lb.	True weight of loaded beam.

   b. Approaches ½ inch below plane of scale platform.

Left-end reaction	6.06 lb.	
Right-end reaction	3.42 lb.	
	9.48 lb.	Apparent weight of loaded beam. Error −0.14 lb, or −1.5 percent.

3. Beam loaded, position 1, high center of gravity.

   a. Approaches level with scale platform.

Left-end reaction	6.12 lb.	
Right-end reaction	3.50 lb.	
	9.62 lb.	True weight of loaded beam.

   b. Approaches ½ inch below plane of scale platform.

Left-end reaction	6.02 lb.	
Right-end reaction	3.40 lb.	
	9.42 lb.	Apparent weight of loaded beam. Error −0.20 lb, or −2.1 percent.

4. Beam loaded, position 2, high center of gravity.

   a. Approaches level with scale platform.

Left-end reaction	4.28 lb.	
Right-end reaction	5.34 lb.	
	9.62 lb.	True weight of loaded beam.

Digitized by Google

b. Approaches ½ inch below plane of scale platform.

Left-end reaction	4. 18 lb.	
Right-end reaction	5. 24 lb.	
	9. 42 lb.	Apparent weight of loaded beam. Error −0.20 lb, or −2.1 percent. (Note.—Same as Case 3.)

On the basis of theoretical consideration, it is to be anticipated that when a two-axle truck is weighed by the two-draft method,[1] the effects which will be contributed solely by conditions of approach alinement may be summarized as follows:

1. There will be no error in the derived weight value if the approaches are level with the scale platform.

2. If either or both of the scale approaches, whether inclined or level, are below the plane of the scale platform, the derived weight value will be less than the true value in all cases in which the center of gravity lies above the plane of the axles.

3. If either or both of the approaches, whether inclined or level, are below the plane of the scale platform, the error for a truck of given

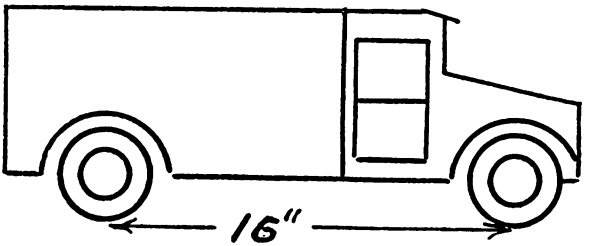


FIGURE 5.

wheel base will be in proportion to the height of the center of gravity above the axles; if the center of gravity lies below the plane of the axles, as it may in the case of a truck with "underslung" body, the error will be of opposite sign; if the center of gravity happens to lie in the plane of the axles there will be no error.

4. If either or both of the approaches are level but below the plane of the scale platform, the error for a truck of given weight, other things being equal, will be greater with a short wheel base truck than with a long wheel base truck; conditions will largely be reversed in the case of inclined approaches.

5. For given conditions of truck position, loading, and wheel base, the amount of error will be in proportion to the gradient of the approaches or to the amount by which the approaches are below the plane of the scale platform.

6. In any case the amount of error will be independent of the load distribution on the axles so long as this remains unchanged during both weighings.

To illustrate some of the effects which low scale approaches may have upon the derived net weight of a motor-vehicle load when the

[1] It is assumed that the front wheels of the truck will be run onto the scale platform for the first weighing, and that for the second weighing the truck will then be advanced until the front wheels are off the platform and on the approach at the opposite end.

Digitized by Google

gross and the tare weights are obtained by the two-draft method of weighing, some of the experiments of demonstration I were duplicated with a small model of a two-axle truck (see fig. 5). The model represents generally the features of a conventional motortruck, except that it is without chassis springs, power plant, and power-transmission elements. The material used to load the truck during the experiments consisted of a metal block so designed that the height of its center of gravity above the axle plane could be changed readily. The weight of the empty truck was 8.61 pounds; the weight of the loaded truck was 18.08 pounds.

Experimental data for the gross and tare weighings of the truck model are presented as demonstration II.

DEMONSTRATION II.—EFFECTS OF LOW APPROACHES ON WEIGHING OF TRUCK BY TWO-DRAFT METHOD

1. Truck empty.

   a. Approaches level with scale platform.

Front-end weight	3. 67 lb.	
Rear-end weight	4. 94 lb.	
	8. 61 lb.	True tare weight of empty truck.

   b. Approaches ½ inch below plane of scale platform.

Front-end weight	3. 62l b.	
Rear-end weight	4. 91 lb.	
	8. 53 lb.	Apparent tare weight of empty truck. Error −0.08 lb, or −0.9 percent.

2. Truck loaded, low center of gravity.

   a. Approaches level with scale platform.

Front-end weight	4. 63 lb.	
Rear-end weight	13. 45 lb.	
	18. 08 lb.	True gross weight of loaded truck.

   b. Approaches ½ inch below plane of scale platform.

Front-end weight	4. 53 lb.	
Rear-end weight	13. 35 lb.	
	17. 88 lb.	Apparent gross weight of loaded truck. Error −0.20 lb, or −1.1 percent.

3. Truck loaded, high center of gravity (same load).

   a. Approaches level with scale platform.

Front-end weight	4. 65 lb.	
Rear-end weight	13. 43 lb.	
	18. 08 lb.	True gross weight of loaded truck.

   b. Approaches ½ inch below plane of scale platform.

Front-end weight	4. 50 lb.	
Rear-end weight	13. 28 lb.	
	17. 78 lb.	Apparent gross weight of loaded truck. Error −0.30 lb., or −1.7 percent.

The significance of the data of demonstration II becomes apparent when these are interpreted in terms of the net-weight values which

Digitized by Google

would be derived from the gross- and tare-weight values obtained under differing conditions of approach alinement. For example, it is evident that the following tare- and gross-weight values might have been obtained with the model under certain conditions:

From demonstration II, items 1 and 3.

Approach alinement		Observed weight, in pounds	
1st draft	2d draft	Tare	Gross
(a) Level	Level	8.61	18.08
(b) Low	Level	8.56	17.93
(c) Low	Low	8.53	17.78

Since the above weight values for tare and for gross might have been obtained under differing conditions, the derived net-weight values might conceivably be any of the following and in error by the percentages indicated.

Approach alinement		Derived net weight	Error	
Tare	Gross			
		Pounds	*Pound*	*Percent*
(c)	(a)	9.55	+0.08	+0.8
(b)	(a)	9.52	+.05	+.5
(a)	(a)	9.47	.00	.0
(c)	(b)	9.40	−.07	−.7
(b)	(b)	9.37	−.10	−1.1
(a)	(b)	9.32	−.15	−1.6
(c)	(c)	9.25	−.22	−2.3
(b)	(c)	9.22	−.25	−2.6
(a)	(c)	9.17	−.30	−3.2

In addition to the effects which may be contributed solely by low-approach conditions and which already have been discussed, the weight value derived by the two-draft weighing of a motortruck may be influenced by certain secondary factors which include: (1) Load shifts occurring between the weighings of the individual drafts and caused either through change in the relative positions of an axle and the truck body or through changes in position of the transported load; (2) the use of brakes, transmission gears, or wheel chocks to hold the truck wheels on an inclined approach; (3) differences in the positioning of the truck wheels on an inclined approach. The results of some incidental experiments performed with the motortruck model to illustrate the probable effects of some such secondary factors are presented as demonstration III.

Digitized by Google

DEMONSTRATION III.—SECONDARY EFFECTS CONTRIBUTED BY MISCELLANEOUS CONDITIONS

1. Truck loaded, gross weight 18.08 lb. Level approach.

a. Front wheels of truck moved from different directions to definite position on scale platform.

Direction of motion when stopped:

	Indicated weight of front end	
Forward	4. 65 lb	------
Backward	------	4. 52 lb
Forward	4. 63 lb	------
Backward	------	4. 49 lb
Forward	4. 59 lb	------
Backward	------	4. 55 lb
Mean indication for given direction	4. 62 lb	4. 52 lb
Difference due to direction (mean)	0. 10 lb	(max) 0. 16 lb
Difference in percent of gross load	0. 6%	0. 9%

b. Load shifted ¼ inch forward between drafts.

Front-end weight before load shift	4. 64 lb	
Rear-end weight after load shift	13. 25 lb	
Apparent gross weight	17. 89 lb.	Error −0.19 lb, or −1.1 percent.

2. Truck loaded, gross weight 18.08 lb. Approach sloping upward to scale platform level at 3-percent gradient.

a. Front wheels on scale, rear wheels at different positions on inclined approach.

Position of rear wheels	Indicated weight of front end
1. 2 inches from scale deck and chocked	4. 43 lb
2. 8 inches from scale deck and chocked	4. 29 lb
Difference due to change of position on grade.	0. 14 lb, or 0.8 percent of the gross weight.

b. Front wheels on scale, rear wheels on inclined approach, 8 inches from end of scale.

Method of holding truck	Indicated weight of front end
1. Rear wheels chocked	4. 42 lb
2. Front wheels chocked	4. 51 lb
3. Rear wheels braked [1]	4. 31 lb

c. Rear wheels on scale, front wheels on inclined approach, 8 inches from end of scale.

Method of holding truck	Indicated weight of rear end
1. Front wheels chocked	13. 48 lb
2. Rear wheels chocked	13. 53 lb
3. Rear wheels braked [1]	13. 45 lb

With regard to the data of demonstration III and to the question of their being applicable to actual circumstances of motortruck weighing, it will be repeated that the experimental data are offered as general qualitative illustrations and are not to be applied directly in quantitative terms. In the former sense they suggest certain probable secondary sources of error or variation when a truck is weighed by the two-draft method, namely:

[1] To simulate the effects introduced by braking one pair of wheels to hold a truck on an inclined approach, holes were drilled through the rear wheels of the model and a slender rod inserted through these holes to transmit to the frame the force exerted by the wheels.

Digitized by Google

1. The indicated weight of either draft may vary according to the direction from which the truck wheels are applied to the scale platform. In the case of the model employed, the variations are attributed to slight shifts of the axles in their bearings; although the axle bearings of a motortruck are so designed that identical shifts are highly improbable, it is conceivable that shifts of the body relative to the axles may occur, as spring shackles, bolster connections, and axle yokes become worn.

2. Shifts of the load within the truck body, caused by starting or stopping the truck after weighing the first draft, may contribute error to the derived weight value.

3. When the scale approaches are inclined upward toward the level of the scale platform, the amount of error caused by the approach alinement condition will be less when each axle load is weighed with the other axle load as near as practicable to the scale platform, thus reducing to a minimum the amount by which the "off-scale" wheels lie below the plane of the platform. (The conclusion stated is predicated upon consistent weighing performance of the scale regardless of the position of the load on the platform.)

4. Chocking the truck wheels to hold them on an inclined approach, although in theory this should not affect the reaction at either axle, may cause weight variations because of induced minor changes in the relative positions of axle and truck body.

5. If the rear wheels of a truck rest upon an inclined approach and are braked while the front wheels are being weighed, the indicated weight value will be affected by the resulting change in the front axle reaction.

Some other secondary sources of error and variation which have not been investigated experimentally but which may be mentioned are: Engagement of the truck transmission gears and clutch to hold the truck on an inclined approach while either draft is being weighed, operation of the truck engine and clutch during the weighing of either draft, and increased spring deflection and tire compression at one end of a truck when the other end is being weighed on a scale with inclined approaches.

Another factor which was not investigated experimentally, and which it is believed may be the cause of very considerable errors, is the probable constraint of scale parts as the scale platform is thrust toward one end and held in this position by the application of brakes or chocks to the off-scale wheels.

To summarize consideration of the secondary factors and their probable effects it may be stated that the errors or variations which they may cause will be independent of those contributed by the previously discussed low-approach conditions. The extent to which the former may combine with the latter to produce compound errors of considerable magnitude is a matter of serious concern. The probability that the effects of various factors may be so mutually mitigative as to produce no appreciable error seems too vague to warrant serious consideration.

To conclude discussion of two-draft weighing so far as motortrucks are involved, it will suffice to say that the evidence indicates the practice to be generally unreliable as a method for accurately determining the weight of motortruck loads.

In the case of the tractor-semitrailer unit, there are two methods which may be employed to establish a tare or gross weight value for

Digitized by Google

the combination by the two-draft weighing procedure. What may be denominated as method 1 is to weigh the front tractor wheels in one draft, and the trailer and rear tractor wheels in the other draft. What may be denominated as method 2 is to weigh the entire tractor in one draft and the trailer wheels in the other draft.

On the basis of theoretical consideration, it is to be anticipated that when the approaches are level with the scale platform, the two methods will yield substantially the same total weight value. It would appear, however, that under the circumstances prevailing in many commercial installations, method 1 is the preferred procedure, for the indicated weight values will not be materially affected by changes in the trailer-axle reaction such as would be caused, for example, by a shift in the position of the load within the trailer body, and they will not be so seriously affected by approaches which are not in the plane of the scale platform, for the major portion of the total load, resting on the middle and rear axles, will be weighed while level on the scale platform.

Experimental investigation of factors which may affect the weighing of tractor-trailer combinations by the two-draft method was confined to some experimental study with a small model of a semitrailer combination (see fig. 6). The model consists of a two-axle tractor which

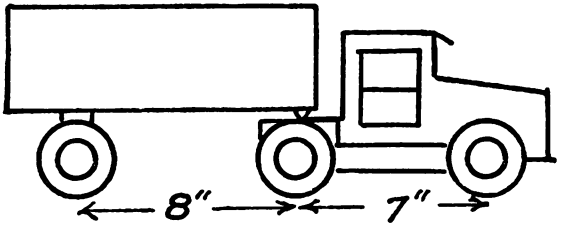


FIGURE 6.

draws and partially supports a one-axle trailer. The two units comprise a three-axle vehicle with a so-called "fifth-wheel" bearing located above and slightly forward of the middle axle. Experiments generally similar to those performed with the truck model were conducted, but no experimental study was made to determine the effects which might be introduced by braking either unit of the combination. The resulting data, presented below as demonstration IV, illustrate (1) the two methods by which a semitrailer combination may be weighed in two drafts, (2) the manner in which the weighing, by either method, may be affected by change in the axle-load distribution, and (3) the effects which may be introduced by low approaches.

DEMONSTRATION IV.—TWO-DRAFT WEIGHING OF SEMITRAILER COMBINATION

Applied load	Indicated weight in pounds
1. Approach level; trailer empty. Combined tare weight 6.30 pounds.	
Front tractor wheels	1. 50
Trailer and rear tractor wheels	4. 76
Tare weight by method 1	6. 26
Both tractor wheels	3. 89
Trailer wheels	2. 41
Tare weight by method 2	6. 30

Digitized by Google

Applied load	Indicated weight in pounds
2. Approaches level; trailer loaded. Combined gross weight 15.77 pounds.	
Front tractor wheels	1. 49
Trailer and rear tractor wheels	14. 26
Gross weight by method 1	15. 75
Both tractor wheels	6. 32
Trailer wheels	9. 42
Gross weight by method 2	15. 74
3. Approaches level; same load on trailer.	
Front tractor wheels	1. 49
Front tractor wheels (load shifted ¼ inch forward in trailer)	1. 49
Change due to load shift	0. 00, or 0.0 percent of gross.
All tractor wheels	6. 32
All tractor wheels (load shifted ¼ inch forward in trailer)	6. 65
Change due to load shift	0. 33, or 2.1 percent of gross.

4. Approaches ½ inch below plane of scale platform.

	Tare	Gross
Front tractor wheels	1. 54	1. 61
Trailer and rear tractor wheels	4. 74	14. 22
Values by method 1	6. 28	15. 83
All tractor wheels	3. 81	6. 12
Trailer wheels	2. 03	9. 40
Values by method 2	5. 84	15. 52

NOTE.—The differences between tare weights and between gross weights, as determined by the two methods (items 1 and 2 above), are considered to be attributable to accidental shifts of the axles or of the "fifth-wheel" bearing of the model.

The data for items 1, 2, and 3 in demonstration IV are seen to corroborate reasonably the theoretical conclusions for the case of approaches level with the scale platform.

The effects which low-scale approaches may have upon the tare- and gross-weight values when either method of weighing is employed are illustrated by the data of item 4 in demonstration IV. It will be obvious from analysis of the data, that the derived net weight of the model load value might vary, as indicated below, according to the method by which the gross- and tare-weight values were obtained. (In this connection, it may be mentioned that, under conditions of actual practice, the tare and gross weighings may be performed on different scales, on different days, and by different parties.)

From demonstration IV, item 4.

Weighing method	Indicated weights		Derived net weights
	Tare	Gross	
	Pounds	*Pounds*	*Pounds*
Tare by 1, gross by 2	6. 28	15. 52	9. 24
Tare by 1, gross by 1	6. 28	15. 83	9. 55
Tare by 2, gross by 2	5. 84	15. 52	9. 68
Tare by 2, gross by 1	5. 84	15. 83	9. 99

Digitized by Google

Since the true net weight of the load was 9.47 pounds, it is indicated that, depending upon the circumstances under which the tare and gross weights were derived, the value obtained for the net weight might be in error by amounts ranging from −0.23 to +0.52 pound, or from −2.4 to +5.5 percent.

Unquestionably, the fundamental conclusion to be drawn from the studies reported upon herein is that the two-draft method of weighing vehicles is too fraught with elements of uncertainty to be a satisfactory means for determining the weight values of transported loads.

Certain measures, whereby the errors contributed by some of the conditions which have been studied may be eliminated or minimized, suggest themselves. For example, in weighing trucks on scales with inclined approaches, the wheels resting on the approach should be as near as practicable to the scale platform. Care should be taken to prevent shifts of load between draft weighings. On inclined approaches the vehicles should be held by chocks rather than by brakes or gears. If either approach to a scale is level with the scale platform, both drafts should be weighed at that end of the scale. Semitrailers should be weighed while disconnected from their tractors; this may be accomplished by supporting the front end of the trailer either on the drop wheels provided or upon some other suitable object. If it be entirely impracticable to disconnect the semitrailer from its tractor, the weighing should be conducted according to method 1; that is, the front tractor wheels should be weighed in one draft, and the trailer and rear tractor wheels should be weighed in the other draft. However, these measures will necessarily be of merely palliative character and of limited effectiveness. Ultimate remedy will lie in provision of scales of sufficient length to allow single-draft weighing of all vehicles. Next in order of practicability and effectiveness as a remedial measure will be provision, at each end of the scale, of approaches having permanent level alinement with the scale platform.

To conclude it will be said that parties or agencies to whom this subject is of direct interest should undertake to collect, by independent investigation under actual conditions of practice, information which may supplement this preliminary study and which will indicate the extent to which the conclusions suggested by theory and experiment are applicable to practical circumstances.

Mr. JENSEN. Your opinion in regard to weighing these long trailers and trucks is that it is almost an impossibility to secure a proper weight by making a two-draft weighing; in other words, you would not advise weighing them that way.

Mr. RICHARD. I personally would not.

Mr. BAUCOM. What are we going to do about it?

Mr. RICHARD. One solution that has been suggested is to use the drop-wheels on trailers so equipped. The tractor can be disconnected and the weight of the trailer alone can be taken.

The CHAIRMAN. The next paper describes the methods which the Bureau employs in testing and inspecting vehicle scales, as a result of the somewhat gradual development since this work was started. This paper will be presented by Mr. Horton, the engineer in charge of the Bureau Vehicle-Scale Testing Unit. Following Mr. Horton's remarks Mr. Crouch, the other engineer on duty with this unit, will make running comments during the showing of the moving picture film illustrating the test of vehicle scales by the Bureau. This is the equipment which you saw in operation last year.

Digitized by Google

METHOD OF TEST AND INSPECTION OF VEHICLE SCALES DEVELOPED BY THE NATIONAL BUREAU OF STANDARDS

By C. F. HORTON, *National Bureau of Standards*

The method employed in testing scales with the Vehicle-Scale Testing Unit of the National Bureau of Standards is being set out herein, since it is felt that the subject of test methods in the case of this type of scale is one of increasing importance. Many States and local jurisdictions are acquiring equipment utilizing an adequate test-weight load, and such equipment should be used to the best advantage.

The Bureau method has been developed over a period of time with the object in view of demonstrating the type of test best adapted for an accurate and thorough check of the performance of a vehicle scale, under such loads and with such distributions of load as are likely to be encountered in service. Necessarily, the number of such loads applied during a test must be limited to an essential minimum in order that an excessive amount of time will not be taken for each test.

Preliminary inspection of scale.—In testing vehicle scales with a large load of heavy test weights, and especially when a heavy strain load is used in combination with these, it is, of course, important to make certain that the scale to be tested is sufficiently strong to stand the total load to be applied during the test. If there is doubt that the foundation, weighbridge structure, or lever system may be strong enough to stand a test to the rated capacity of the scale, it is best to inspect these parts before making the test, and if necessary, then so to limit the applied load that the scale will safely support it.

Testing equipment.—The National Bureau of Standards Vehicle-Scale Testing Unit consists of a three-axle dual-tired tandem-drive motortruck of approximately 40,000 pounds maximum gross weight, carrying 15 1,000-pound test weights, two sets of smaller weights, and the tools and accessories necessary in the operation of the equipment. The 1,000-pound weights are handled three at a time by a horizontal-boom crane, fully power-operated by power take-off from the truck engine. After the weights are unloaded from the truck, they are handled by means of a conventional two-wheel rubber-tired cart, which can be easily manipulated on a smooth and level surface by one man.

One of the small sets of weights carried as part of the equipment is a set totaling 100.5 pounds, including three 20-pound, two 10-pound, two 5-pound, four 2-pound, two 1-pound, and one ½-pound weights. This set of weights is used on the scale platform for determining scale errors by the balancing-weight method, the first step in the test of a vehicle scale being to place 50 pounds of these weights on the platform and then to balance the scale with all indicating elements set at zero. This permits the determination of errors throughout a range of plus or minus 50 pounds, by manipulation of the balancing weights. On most vehicle scales, except automatic-indicating scales having 20-pound minimum graduations, or very insensitive beam scales, errors are determined with the balancing weights to the nearest pound.

The other small set of weights is a set of Monel-metal counterpoise test weights. The counterpoise test weights are used on the weigh-beam counterpoise hangers during the regular test of beam scales designed for use with removable counterpoise weights. The counterpoise weights supplied with the scale are then checked for accuracy by means of an equal-arm, portable balance sensitive to ½ grain. The

Digitized by Google

counterpoise test weights are specially adjusted to one-fifth class C tolerances for this purpose.

General test procedure, 0 to 15,000 pounds.—The normal procedure in testing a beam scale of 20-ton motortruck capacity is this: First, the zero-load balance of the scale is noted; 50 pounds of balancing weights are then placed on the platform, and the scale is rebalanced with all indicating elements set at zero. The zero-load sensibility reciprocal is then determined by adding the required number of small weights to the platform. The 1,000-pound weights are then lowered in groups of three to the platform, readings generally being taken at 3,000, 9,000, and 15,000 pounds. The weights are applied as nearly symmetrically as is practicable with respect to the longitudinal center line of the platform, so as to give a balanced end test. Next, the test weights are shifted to an approximately distributed load over the platform, usually this being most conveniently accomplished by shifting eight test weights down to the second end of the scale, leaving seven weights at the first end. After taking a reading at this load, an SR determination is also made. Then the remaining test weights are shifted down to the second end of the scale, and a reading is taken at 15,000 pounds; readings are also taken at 9,000 and 3,000 pounds as the test weights are removed from the platform and placed in such positions, in groups of three, that they may readily be loaded into the test truck.

A reading is taken on the main bar of the weighbeam at all of these loads, and in addition, readings are taken on the tare bar, if the weighbeam is equipped with a tare bar, at two points, preferably at or near capacity of the tare bar, and at some intermediate load. For a tare bar of a capacity of 15,000 pounds or more, the points at which readings are usually taken are 3,000 and 15,000 pounds.

If the scale has a fractional bar of 1,000-pound capacity (or 990 pounds, as is usually the case if the scale has a type-registering weighbeam) the fractional poise is checked directly against a 1,000-pound load on the platform. Scales having 500-pound fractional poises are checked at any of the regular test loads by checking the main fractional poise against a main-bar notch, and the tare fractional poise against a tare-bar notch.

General test procedure, strain load.—After the test weights are removed from the scale the zero balance is checked; then the empty test truck is driven on the scale for a strain load. No attempt is made to use the test truck as a standard test-weight load, since large variations in its weight will occur, because of variations in the quantity of gasoline in the tanks, dirt on the wheels and chassis, tire wear, and change in the amount of baggage. The test truck is used simply as a heavy strain load, and its only change in weight during a strain-load test will be due to the amount of gasoline consumed in reversing the truck on the scale, and in loading the test weights into the truck. The weight of gasoline consumed during these operations is accurately determined by running the engine on gasoline drawn from a special 22½-pound capacity compartment built in one of the regular gasoline tanks. This compartment is equipped with a gage glass calibrated in pounds, so that the total amount of gasoline consumed during the strain-load test is readily determined by the difference in the gage readings taken at the beginning and at the end of this test. The weight of gasoline consumed in this procedure is from 3 to 5 pounds in most cases.

Digitized by Google

On scales of 20- to 24-foot platform length, the test truck is balanced out in two positions, with the rear axle at either end of the scale. With the empty truck balanced out as a strain load on the scale, the test weights are then loaded into the truck, thus, in effect, reapplying the 15,000-pound test-weight load to the scale, which carries the total load on the scale up very close to its capacity of 20 tons. The scale error at this load, that is, the error of the scale in registering the net load of 15,000 pounds which has been added to the strain load, is determined. An SR reading is then taken, then the truck is reversed on the scale and the reading for scale error with the rear axle at the other end of the scale is taken.

On scales over 24 feet in length and less than 34 feet in length, it is desirable to make strain-load tests with the rear axles as near the center of the platform as possible, in addition to the two spots with the rear axle at each end of the platform. In such tests, the truck is balanced out in four different positions, as follows: First, with the truck rear axle at first end of scale; second, with the truck moved forward until the front axle is at the second end of the scale, at which position the rear axle will be at some point intermediate between the center of the scale and the first end of the scale; third and fourth, these same two relative positions of the truck, respectively, except that the truck is reversed.

On scales with platform lengths of 34 feet or longer, it is possible to place the rear axles at the center of the platform, hence only three positions are utilized for the strain load, right, left, and center. The "center" position strain load may be made with the front of the truck either to the right or left. It is important, however, that for all strain-load observations, the truck be placed in as nearly as practicable the same positions loaded as it was when balanced out in the various positions empty.

The strain-load test with rear axle at or near the center of the platform of long-platform scales is particularly valuable in finding the source of errors of such scales as have defects in weighbridges, faulty weatherguard installations, and, in some cases, faults in the lever system also.

Since a platform length of at least 20 feet is required for the test truck, it is not used as a strain load on scales having a platform length of less than 20 feet. In such cases, any available heavy short-wheel-base truck is utilized, the weights being loaded on the scale either with the crane or by means of the handling cart. A scale with insufficient overhead clearance for the test truck requires a similar procedure, though the crane cannot of course be used for reapplying the test weights.

At the conclusion of every test the zero balance is checked.

Modification of procedure for automatic-indicating scales.—On automatic-indicating scales of the dial type, the above procedure is modified in several ways. In order to check the accuracy of the dial mechanism adjustment throughout the range of the dial, it is necessary to add the test weights to the platform one at a time up to the dial capacity, taking readings at each of these loads. The first unit weight is then checked, after which test weights are added in increments equal to the dial capacity, thus checking each unit weight up to the available test load of 15,000 pounds. The strain load is then applied, and the test weights are loaded into the test truck, also in increments equal to the

Digitized by Google

dial capacity, thereby checking all unit weights, so far as practicable, directly against test weights on the platform.

On beam-type scales equipped with automatic-indicating devices, the testing procedure is the same as with the usual beam-type scale, except that a reading of the device, as well as a beam reading, is taken at every load within the capacity of the device, the device serving simply as a balance indicator in the case of all readings taken on the beam.

Modification of procedure for wagon scales.—Wagon scales are usually tested with the test weights only, strain loads not ordinarily being required. Wagon scales are never tested with an end loading exceeding 50 percent of the capacity of the scale. For convenience in handling the weights in groups of three, the end loading utilized on a 20,000-pound wagon scale is generally limited to 9,000 pounds. In no case is the total test load carried materially beyond the rated capacity of the scale, even though in the case of some wagon scales the motortruck loads weighed in service on these scales have far exceeded the motortruck ratings, and in some instances even the wagon ratings.

Inspection.—Whenever practicable, after each test, a complete inspection of the scale is made. In this inspection, the general condition of the lever system, foundation, weighbridge structure, and foundation for the indicating elements is checked; inspection is made for dirty, worn, or rusted pivots and bearings, binds of any kind, out-of-plumb connections, out-of-plumb bearing assemblies, loose levers, loose or incorrectly positioned fulcrum stands, incorrectly alined ball-check plates, out-of-level levers, loose extension arms on torsion levers, and close clearances at any part of the scale. Of course, any accumulation of foreign matter in the pit is noted. The weighbeam assembly is checked to see that it is rigidly mounted, this being especially important on scales of the automatic-indicating type or those equipped with an automatic-indicating attachment. The weighbeam assembly is checked for level, for cleanliness, particularly of the notches and poises, for worn or battered poises and stops, for worn notches or pawls, and for a weak or broken pawl spring in the main poise.

In each inspection the performance of the scale, as shown by the test, is kept in mind since this, of course, aids in finding the faulty conditions which adversely affect the weighing performance of the scale. The strain-load test is frequently of particular value in indicating faulty conditions of the pivots and bearings, faulty foundations, faulty weighbridge structure, and, especially on automatic-indicating scales, weak or sagging foundations for the indicating elements.

Field records.—All test observations are recorded on a test-record form. An inspection-record form is used for recording all essential data about the scale, its make, type, capacity, capacities of the various indicating elements, platform size, type of lever system, type of foundation, as well as any faulty conditions found during the inspection.

General considerations.—For the efficient operation of a vehicle-scale test truck such as the one operated by the National Bureau of Standards, two men are required. With this equipment it is usually possible to make the complete test of a 20-ton motortruck scale in approximately 1 hour. Smaller scales require much less time for the test, usually from 25 to 45 minutes if a strain-load test is not required.

Digitized by Google

These periods of time do not, of course, include the time required for a complete inspection in the scale pit, which will require an additional period of from 10 to 30 minutes. The time required for a pit inspection is largely determined by the accessibility of the lever system. Unfortunately, at the present time there are relatively few vehicle scales which have what could be called satisfactory accessibility.

Safety considerations are of prime importance in operating a large-capacity scale-testing equipment. Caution should always be exercised in handling heavy test weights. Special attention is exercised to see that no one gets too close to, or under, the test weights, and to see that no one stands between them and the side of a building or other fixed object while they are being handled by the crane. The tackle bar used for hoisting three weights at a time is so arranged that it is not necessary to touch the hooks with the hands when engaging or disengaging the weights—this is an important safety measure, since it minimizes the possibility of injury to the fingers or hands. "Safety First" is a watchword which, perhaps needless to say, is always followed.

(Following the presentation of the above paper, there was shown a motion picture of the test of a vehicle scale by the National Bureau of Standards Vehicle-Scale Testing Unit. During the running of this film, Ralph W. Crouch, Jr., a member of the staff of the Bureau, made appropriate explanations.)

DISCUSSION OF ABOVE SUBJECT

Mr. JENSEN. I would like to ask if it would be possible for you to give us copies of the blank forms that are used in the field so that we might use them as models in making our field tests.

Mr. HOLBROOK. I think that can be arranged.

Mr. BAUCOM. How long does it take to test a large scale, say of about 20 tons?

Mr. CROUCH. It takes from 1 to 1¼ hours.

Mr. HARRINGTON. How much time is given to the last inspection?

Mr. CROUCH. Quite a bit.

Mr. ALFREY. Do you use your last check on balance in calculating your error?

Mr. CROUCH. We have not been doing so.

Mr. FULLEN. Where a scale is not balanced or where it has been tampered with, you would tie it up and prosecute? Would you require that it be repaired?

Mr. CROUCH. The only thing we can do is to report conditions to the State man. It is up to him to decide whether to tie it up.

Mr. WOODLAND. You do not make any routine inspections for a State?

Mr. CROUCH. No.

The CHAIRMAN. Gentlemen, a number of you have met these young men in your various jurisdictions, and you have extended to them every courtesy. I would like to express my appreciation of that fact at this time. They are going on with this work, and during the course of the next year I hope that a number of additional officials will get acquainted with their work in their own States.

123292—39——7

Digitized by Google

REPORT OF COMMITTEE ON PROPOSED FEDERAL LEGISLATION TO PROVIDE ASSISTANCE FOR THE STATES IN ADMINISTRATION OF WEIGHTS AND MEASURES LAWS, PRESENTED BY JOHN P. McBRIDE, CHAIRMAN

Gentlemen: Your Committee met on May 31 and after consideration and discussion agreed to ask interested members of the Conference to appear at an open meeting of the Committee to be held from 5:30 to 7 p. m., on June 1, to offer suggestions and comments to assist your Committee in arriving at the basis of its report.

On June 1 your Committee held an open meeting in accordance with the decision to receive comments.

After further consideration and discussion your Committee unanimously adopted a motion to request the Conference to continue this Special Committee for another year to enable it to secure more complete information from the several States in order to report fully to the Conference at the next regular annual session in 1939.

(Signed) JOHN P. McBRIDE, Massachusetts, *chairman*,
J. H. MEEK, Virginia,
ROLLIN E. MEEK, Indiana,
CHARLES C. READ, New Jersey,
W. P. REED, Atlanta, Ga.
FRANK L. HAMMON, Idaho,
S. T. GRIFFITH, Baltimore, Md., *acting secretary*.

DISCUSSION OF ABOVE REPORT

Mr. HOLBROOK. Mr. McBride, could you tell us in brief what the bill is all about? It was printed in the last Conference report, but some delegates may not have it in mind.

Mr. McBRIDE. The bill proposes that the Congress shall appropriate a sum of money and that allocation of certain sums shall be made to the several States which may qualify to receive that money. One of the qualifications would be that the States would themselves appropriate an amount of money equal to what they might expect to be allocated to them. The determination of the eligibility of the States to participate would be by the Secretary of Commerce in accordance with a procedure set out in the bill. Several conditions were set up: The participating States would have to have a State weights and measures law, they would have to be active in enforcing it, and the guide of conduct would be the specifications, tolerances, and regulations as adopted by this Conference if and when the specifications so adopted were approved and published by the National Bureau of Standards.

The bill provides that the method of voting at this Conference will be determined on a population basis with a minimum voting right to each State of three votes; for each additional million of population a State would have one additional vote.

In brief, I think that covers the salient features of the bill.

Mr. CULLEN. Mr. Chairman, I wish to make a motion that the Committee be continued for another year, with thanks for the work they have done.

(The motion was seconded, and the question was called for.)

The CHAIRMAN. You have heard the motion. I am going to ask for a rising vote. Those in favor of this motion please rise. The secretary will please count the number voting.

Digitized by Google

Mr. HOLBROOK. May we have tellers on this, Mr. Chairman?

The CHAIRMAN. I will appoint Edward R. Fisher of Rhode Island, and Arden A. Reed of Oregon, to act as tellers.

Mr. CULLEN. Is there any necessity of counting the vote with such a great number standing?

The CHAIRMAN. Will the opposition please rise? No one rising, the motion is unanimously carried.

REPORT ON THE TESTING OF VEHICLE SCALES BY THE NATIONAL BUREAU OF STANDARDS IN COOPERATION WITH THE STATES

By RALPH W. SMITH, *National Bureau of Standards*

The National Bureau of Standards inaugurated its program of vehicle-scale testing in cooperation with State and local weights and measures officials in November 1936. For somewhat detailed accounts of the purposes of this program, of the Bureau's testing unit, and of the general plans under which the work is carried on, reference may be made to the Reports of the Twenty-sixth and Twenty-seventh National Conferences on Weights and Measures.

A year ago there was presented to the National Conference a report upon the results of the Bureau's tests of vehicle scales, covering the period from the beginning of the work to May 19, 1937. During that period, cooperative testing schedules had been completed in five States—Virginia, North Carolina, South Carolina, Georgia, and Florida.

With this present report on the vehicle-scale testing service of the Bureau, it is proposed to inaugurate a series of reports, to be issued in succeeding years, each of which will summarize results in this field from the beginning of the service, and will include such analysis, comments, and recommendations as may be considered timely and appropriate. It is believed that this plan will provide more informative data than separate reports on each year's work, because the work will continually be prosecuted in new territory and hence the results of one year's testing will never be directly comparable with the results of another year's work, as would be the case were the same territory being covered year after year. The present report, therefore, is concerned with a study of the results of the Bureau's tests of vehicle scales for the period November 1936 to May 1938, and related matters.

Testing schedules have been completed in 16 States—Virginia, North Carolina, South Carolina, Georgia, Florida, Maryland, Delaware, Rhode Island, Maine, New Hampshire, Vermont, New York, Alabama, Mississippi, Louisiana, and Tennessee. The cooperating officials have been officers exercising full or limited weights and measures powers in all but two of the States enumerated; in Mississippi and in Louisiana the Governors designated the State Department of Agriculture and the Department of State Police, respectively, as the cooperating agencies.

Some few State-owned scales were tested in Connecticut and New Jersey, and a few Federal scales were tested in Massachusetts and Pennsylvania; no commercially owned scales were tested in these four States, since the States were already, or were about to be, equipped with adequate testing equipment of their own, and no work by the Bureau's unit was needed.

Digitized by Google

There have now been made well over 1,000 tests of vehicle scales. Of this number, 46 tests have been of scales owned by the Federal Government. Arrangements are made to test, with the Bureau's equipment, Federally owned vehicle scales located in the territory traversed; since, however, such tests are not included in the State schedules and the scales are not subject to supervision by weights and measures officials, data on these tests are not included in this report.

It should be stated that a very few scales have been tested twice, and that for statistical purposes each such retest has been treated as though made on a scale not previously tested.

This report, then, is concerned with a study of the results of tests made by the Bureau on scales owned by States, cities, towns, counties, and commercial agencies. The number of tests involved is 967. Of these 967 scales, 433 scales, or 45 percent, were of the wagon type, and 534 scales, or 55 percent, were of the motortruck type; 205 scales, or 21 percent, were equipped with dials or with automatic-indicating devices having a substantial weighing range; 27 scales, or 3 percent, were equipped with over-and-under indicators carrying weight graduations; and the total of the two groups having automatic indication of weight of whatever extent comprised 232 scales, or 24 percent of those tested.

Accuracy.—Statistical data are presented in the table which follows, scales being separated first upon the basis of their type, and second upon the basis of ownership or principal use. The mean percentage errors are computed from maximum percentage errors developed in the tests, regardless of the size or position of the test-weight load. Scales are classified as accurate or inaccurate upon the basis of the tolerances adopted by the National Conference on Weights and Measures for used scales which, in general, may be said to be ± 0.20 percent, applied to errors of the scale indications with respect to the standard-weight loads used.

TABLE 1.—*Vehicle-scale test results, November 1936 to May 1938*

Type, ownership, or use	Number tested	Found accurate		Found inaccurate		Numerical mean of maximum percentage errors
		Number	*Percent*	*Number*	*Percent*	
Wagon scales	433	76	17.6	357	82.4	1.41
Motortruck scales	534	138	25.8	396	74.2	1.04
State, city, town, or county	67	13	19.4	54	80.6	.63
Coal or coke	582	125	21.5	457	78.5	1.16
Cotton or cotton products	129	35	27.1	94	72.9	1.38
Farm products, including fruit and sugarcane	62	18	29.0	44	71.0	.83
Scrap materials	56	6	10.7	50	89.3	2.18
Stone, sand, or gravel	16	2	12.5	14	87.5	1.93
Public weighing	9	2	22.2	7	77.8	.88
Miscellaneous	46	13	28.3	33	71.7	1.16
Total	967	214	22.1	753	77.9	1.20

Table 1 discloses that of the 967 vehicle scales covered by this report only about 2 out of 9 were found to be accurate, and that the mean of the maximum percentage errors of all of these scales was 6

Digitized by Google

times the basic tolerance allowable. Less than 1 out of 5 of all wagon scales were accurate, the mean percentage error of this group being about 7 times the basic tolerance; of the motortruck scales only 1 out of 4 were accurate, the mean percentage error of this group being more than 5 times the basic tolerance. In the case of scales used for particular purposes, as many as 7 out of 8 were found inaccurate in each of 2 groups, and the mean percentage error of one of these groups was nearly 11 times the basic tolerance.

Test data are presented graphically in figure 7, the graph being divided into two parts. On the upper portion of the graph are

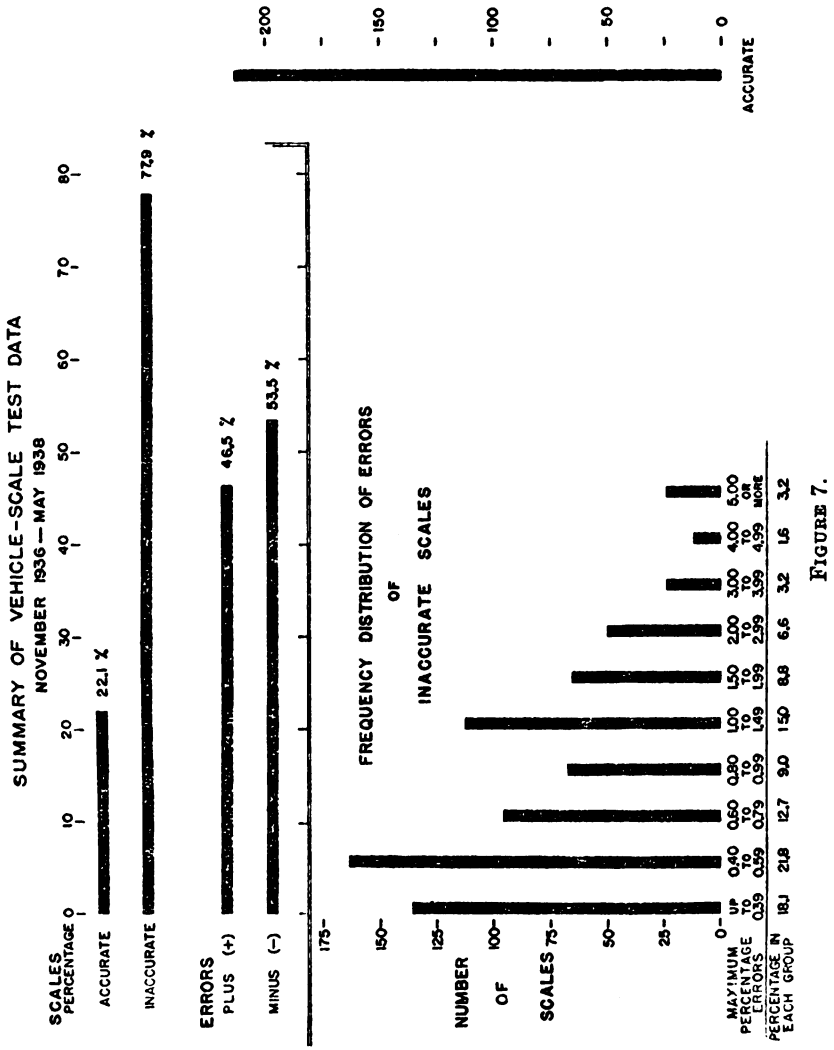


FIGURE 7.

shown percentages of scales found accurate and inaccurate and the percentages of scales having plus and minus errors; the latter data show that there was no significant difference in the numbers of scales found to be overweighing and underweighing. In the lower portion

Digitized by Google

of the graph, maximum errors found on inaccurate scales have been classified on the basis of their magnitudes; in general, the frequency of errors is shown to decrease as their size increases. The scales found accurate are plotted at the extreme right of the graph for purposes of comparison with the error-distribution plot.

The scales reported upon above include 20 scales found to have maximum errors in excess of 5 percent of the applied test-weight loads; these errors range from 5.5 to 59.70 percent. If these 20 scales were to be disregarded because of their abnormally large errors, and if the mean errors were to be recomputed for the groups affected, the mean of the maximum percentage errors would be reduced as shown in table 2.

TABLE 2.—*Numerical mean of maximum percentage errors*

Type, ownership, or use	All scales	Excluding 20 scales having abnormally large errors
	Percent	*Percent*
Wagon scales	1.41	1.01
Motortruck scales	1.04	.71
State, city, town, or county	.68	.68
Coal or coke	1.16	.88
Cotton or cotton products	1.38	.71
Farm products, including fruit and sugarcane	.83	.71
Scrap materials	2.18	.92
Stone, sand, or gravel	1.03	.93
Public weighing	.88	.88
Miscellaneous	1.16	1.06
Total	1.20	.84

An analysis of the test results discloses that weighbeams were found to be inaccurate in the case of more than one-fourth of the scales tested. These inaccuracies include faulty agreement among the several bars of a weighbeam on scales not utilizing counterpoise weights, inaccurate weighbeam indications independent of scale ratio errors on scales utilizing counterpoise weights, and inaccuracies of weighbeams subordinate to dials.

There were tested 112 scales which utilized counterpoise weights, such scales comprising 12 percent of the total number tested. These scales utilized a total of 599 counterpoise weights (exclusive of some weights designed for use on scales of low multiple), of which 247 weights, or 41 percent, were found to be accurate, 77 weights, or 13 percent, were found to be heavy, and 275 weights, or 46 percent, were found to be light.

Sensitiveness.—There were 729 scales, or 75 percent of the total, to which SR requirements were applicable. Of this number, 7 scales, or 1 percent, were found to be in neutral or unstable equilibrium, 334 scales, or 46 percent, were not sufficiently sensitive, and 388 scales, or 53 percent, were found to have sensibility reciprocals within the prescribed limits.

Zero-load balance.—Early in the testing program, it was decided to record the amounts, if any, by which scales were found out of balance at zero load. Such data are available on 925 scales. In 25 instances, or 3 percent, scale operators were found to be using one of the weighbeam poises to effect zero balance of their scales; although these scales

Digitized by Google

were seriously out of balance when the poises were returned to zero, they have been considered, for record purposes, to have been in balance as found. However, 271 scales, or 29 percent of those for which data are available, were found out of balance at zero load by amounts in excess of 5 pounds, and these zero-balance errors ranged up to a maximum of 1,020 pounds. It should be noted, however, that in some 12 instances, scales more or less seriously out of balance had not been in use for some time prior to the tests; if these scales be excluded from consideration, the maximum zero-balance error found was 265 pounds.

Loads weighed.—Many and serious instances of overloading of scales have been disclosed. There appears to be little appreciation on the part of scale operators of suitable limitations on the sizes and character of vehicle loads weighed on their scales, particularly when the scales are of the wagon type. It is very well recognized by scale manufacturers that wagon scales should not be used for the weighing of motortruck loads in excess of 60 percent of their nominal capacities, and many wagon-scale weighbeams are marked to show this limitation. Yet the overloading of wagon scales with respect to this criterion has been recorded in the case of 63 percent of the 433 wagon scales tested, or 273 scales; 69 scales, or 16 percent, have been subjected to motortruck loads equalling the "wagon" capacities of the scales, and motortruck loads in excess of nominal "wagon-scale" capacities have been reported in the case of 20 scales, or 5 percent of the wagon scales tested. Maximum overloading was reached in the case of a 12,000-pound scale used for weighing 18,000-pound motortruck loads.

The weighing on motortruck scales of motortruck loads in excess of the nominal scale capacities has been reported in 32 instances, or 6 percent of the motortruck scales tested.

The Bureau's test of a wagon scale conforms to the method of use contemplated by the scale manufacturer and does not disclose the weighing results which follow when the scale is subjected to large motortruck loads. Quite naturally in the test of any scale, the scale is not loaded beyond its nominal capacity. It follows that the Bureau is without information as to the magnitude of the errors which may have developed under the conditions of overloading discussed above.

Following the adoption by the National Conference in 1937 of the regulation to the effect that vehicle scales should not be used for the weighing of loads of less than 1,000 pounds, there were recorded the minimum loads being weighed on the scales tested. Such data are available for 340 scales. It was found that 157 scales, or 46 percent of those reported upon, were being used to weigh loads of less than 1,000 pounds; on 111 of these, or 33 percent of the total, the minimum loads weighed were 100 pounds or less. The smallest load recorded was 10 pounds, reported in two instances.

Results of inspection.—The inspection of scales, particularly as to conditions in the pits, continues to be an essential element of every test conducted by the Bureau's testing unit whenever such inspections can be made. Unfortunately, poor accessibility to the lever system, or the presence of an excessive amount of water or foreign matter in the pit, or a combination of these conditions, not infrequently makes it impracticable to conduct a proper inspection of the scale parts in the pit, or entirely precludes such inspection. Either no pit inspection at all, or only partial inspection, could be made in the case of 105 scales, or 11 percent of those tested.

Digitized by Google

Before the presentation of a summary of the faulty conditions of installation and maintenance disclosed by the inspections of vehicle scales, mention might be made of a few of the unusual conditions which have been found. In two instances, water has been found in weighbeam poises. A weighbeam load bearing steel was installed upside down. Two scales constructed with wooden levers were encountered. The lead seal of approval of the weights and measures official had been affixed to the main weighbeam poise of one scale. A balance-ball assembly had lost motion equivalent to a platform load of approximately 130 pounds. The truss post of a trussed main lever was entirely disengaged and was lying on the bottom of the pit. In the repair of a broken lever, the nose-iron had been welded to the lever. A weighbeam faceplate was incorrectly marked, the indication "11,000" appearing between the indications of "8,000" and "10,000." An overhanging "track" had been mounted on a scale platform for the purpose of weighing long vehicles on a short scale. A lever system was so badly out of alinement that the extension-lever tip pivots would not remain on their bearings. A cardboard shim, used in the poise slot to improve the weight impressions of a type-registering weighbeam, was regularly left in position, thus making the poise heavy. A unit weight and the dial at capacity were found out of agreement by 100 pounds.

Proceeding now to a statistical consideration of faults of installation and maintenance, three conditions may be said to be definitely associated with installation, namely, accessibility, pit drainage, and scale approaches, while many other faulty conditions reported may be caused primarily or partially by poor installation and may be partly caused or may be aggravated by poor maintenance. Percentages given below are based, whenever this is considered justified, upon the total number of scales tested; in other cases, the percentages are based upon the number of scales to which the condition under consideration is applicable or on which the particular condition could be determined.

Accessibility to the scale parts in the pit for purposes of inspection and maintenance is reported for all but three of the scales tested. Conditions are reported as "bad" for 18 scales, or 2 percent; as "poor" for 198 scales, or 21 percent; as "fair" for 398 scales, or 41 percent; as "good" for 338 scales, or 35 percent; and as "very good" for 12 scales, or 1 percent.

Scale lever systems were installed below the surface of the ground in 954 instances. No provision had been made for pit drainage, or it could not be determined that such provision had been made, in the case of 554, or 58 percent, of these installations.

Approaches to scales, which should be smooth, straight, and in the plane of the scale platform for a reasonable distance from each end of the scale, were reported as "rough" in 79 installations, or 8 percent, and as "curved" in 174 installations, or 18 percent. Disregarding "slight" inclines, 473 scales, or 49 percent of those tested, were found to have one or both of the approaches inclined to the scale platforms, the approach in most cases sloping upward to the platform; in 157 of these cases, or 16 percent of all scales tested, the gradients were 5 percent or more, the maximum incline reported being 30 percent.

Water was found standing in the pit, or the pit drain was reported clogged, in the case of 163 scales, or 17 percent. Scale pits were dirty

Digitized by Google

in 405 cases, or 44 percent; in many cases the accumulations of dirt, coal, or other foreign matter were sufficient to cause interference with the lever systems, and in some instances one or more levers were literally buried.

The structural steel in the pit has been found to be rusting in the case of 258 scales, or 29 percent.

No provision had been made for protection against corrosion of the pivots and bearings of the lever system in the case of 411 scales, or 44 percent of the scales on which this condition could be determined, and in the case of 51 additional scales, or 5 percent, only a part of the pivots and bearings were protected.

The pivots and bearings were found to be rusting or dirty or both in the case of 444 scales, or 50 percent. Pivots and/or bearings were found to be worn in the case of 165 scales, or 19 percent. Undoubtedly there were many instances of badly worn pivots and bearings which were not reported, because of the impracticability, under prevailing pit conditions, of determining the actual state of these parts. Pivots were found to be displaced from proper position on their opposing bearings in the case of 129 scales, or 15 percent. Pivots or bearings were reported to be broken in 13 instances, 2 cases of missing pivots were reported, and there were numerous instances in which the anti-friction plates were found to have been broken off.

Bearing assemblies or connections, including beam rods, were found to be out of plumb in the case of 358 scales, or 40 percent. Levers were reported to be out of level in the case of 227 scales, or 26 percent. There was actual interference with elements of the lever system in the case of 112 scales, or 13 percent; a like number of cases were reported in which clearances around elements of the lever system were inadequate. Faults associated with lever stands or with supports for suspended levers were reported in the case of 52 scales, or 6 percent. Faults associated with lever foundations were reported in the case of 36 scales, or 4 percent. Levers, lever extension arms, or T bearings were found to be loose in the case of 32 scales, or 4 percent. One broken lever was found in service, and several instances of defective weighbridge girders were reported.

Faults associated with the platform checking means were reported in the case of 108 scales, or 12 percent. Clearances between scale platform and coping were found to be either too large or too small on 311 scales, or 32 percent. Repairs were needed on the platforms of 212 scales, or 22 percent. Surface alinement between scale platform and coping was faulty in the case of 96 scales, or 10 percent.

The weighbeam parts of 229 scales, or 25 percent, were found to be dirty, rusting, or tarnished. Mechanical faults associated with weighbeam assemblies, such as worn or missing poise pawls, battered zero stops, defective trig loop assemblies, etc., were reported in the case of 163 scales, or 18 percent. Weighbeam or automatic-indicating elements were found to be loosely or insecurely mounted in the case of 143 scales, or 16 percent. Clearances were inadequate around beam rods in 55 installations, or 6 percent. Many weighbeams were found to be out of level, that is, not horizontal when the weighbeam tip was at the center of the trig loop. Seven instances of interference with a weighbeam were reported.

Interferences in automatic-indicating mechanisms were reported in the case of 50 scales, or 22 percent of the number equipped with

Digitized by Google

automatic-indicating elements. The indications were partly illegible or otherwise faulty in the case of 17, or 7 percent, of the scales which were essentially "automatic-indicating" scales. Six instances of mechanical faults associated with unit-weight mechanisms were reported.

NEWLY INSTALLED MOTORTRUCK SCALES

By F. S. Holbrook, *National Bureau of Standards*

The program of vehicle-scale testing being conducted by the National Bureau of Standards in cooperation with the States has developed certain facts in relation to newly installed motortruck scales which are so extraordinary as to merit most careful study by all the manufacturers and installers of vehicle scales and by all the officials in charge of the administration of weights and measures laws in the United States.

Dates of installation.—Among other data obtained by the Bureau inspectors are the dates of installation of scales tested, whenever this information can be procured. A number of scales tested are reported to have been installed very shortly after the date at which the type of scale known as the motortruck scale, as distinguished from the wagon scale, first came on the market, in 1912 or 1913. Motortruck scales have been encountered that are reported to have been installed in every year since that date to the present time. Naturally many of the older scales have not received proper maintenance throughout the years. Thus, whether through age or through failure on the part of the owners properly to care for them or as a result of both factors working in unison, many of these scales are in bad condition.

However, in the last several years a large number of new motortruck scales have been installed. Apparently many were sold in 1934, 1935, 1936, and 1937, and thus many of the scales tested had been installed during these years. As a result, the average age of the motortruck scales tested is not as great as might be supposed. At one stage of the investigation it was determined that the average age of motortruck scales tested to that date was some 8 years. It would be supposed that the accuracy of the scales recently installed would tend to offset the inaccuracy of scales installed many years ago. In the case of very recent installations, even if the owner were failing properly to maintain his scale, this would have a very much less marked effect on its mechanical condition and its accuracy than in the case of older installations. It was decided then, that it would be of value to determine the accuracy of motortruck scales installed only shortly before they were tested by the Bureau equipment.

For this purpose data were computed on scales installed in the same calendar year, and in the calendar year preceding the year in which they were tested by the Bureau equipment. The average age of scales of the first group would be about 6 months, of the second group about 18 months, and of the combined groups somewhat over 12 months. It was found that there were involved 71 scales, or some 13 percent of the motortruck scales tested, enough to make the results of value; 23 scales, or some 4 percent of the motortruck scales tested, were in the first group and 48 scales, or about 9 percent, in the second.

Digitized by Google

Accuracy.—The test data on the accuracy of newly installed motortruck scales are given in the following table:

Date of installation	Number of scales	Accurate		Inaccurate		Mean of maximum percentage errors
		Number	*Percent*	*Number*	*Percent*	
In same year as test	23	4	17.4	19	82.6	0.67
In year preceding test	48	15	31.2	33	68.8	.54
Total	71	19	26.8	52	73.2	.58
All remaining motortruck scales	463	119	25.7	344	74.3	1.11

The figures indicate that of motortruck scales tested by the Bureau in the same calendar year as that in which they were installed—an average period of some 6 months having elapsed since installation—about one motortruck scale in six was found to be accurate within prescribed tolerances; the mean error of these scales was almost 3½ times the basic tolerance.

Of the motortruck scales tested in the calendar year following that in which the scale was installed—these scales would have averaged some 18 months in service—something less that one motortruck scale in three was accurate, the mean error of these scales being more than 2½ times the basic tolerance.

Of the combined groups—installed on the average somewhat more than 12 months prior to the test—about one scale in four was accurate and the mean maximum error was some three times the tolerance.

The figures just given are to be compared with the general accuracy of the remaining motortruck scales, the figures for which are appended to the table above. The almost unbelievable conclusion is demonstrated that insofar as percentage of scales accurate is concerned, the new installations are not substantially better than the general average installation. Only when the figures representing the mean of maximum errors are compared are the new installations found to be substantially more accurate than the old. The mean error for the former group is 0.58 percent, or approximately one-half the mean error of 1.11 percent for the latter.

Some figures in relation to SR's may be of value. It is found that of 50 newly installed scales to which the SR requirements were applicable, 28 scales, or 56 percent, complied with the appropriate requirement for scales in use; the remaining 22 scales, or 44 percent, did not so comply. Of the 15 scales in this group which are classified as accurate, 11 scales, or 73 percent, complied with the requirement; of 35 inaccurate scales, 17 scales, or 49 percent, complied. In the case of the accurate scales, those not complying exceeded the maximum value allowed by an average of 5.5 pounds; the average excess of 17 inaccurate scales was 10 pounds, 1 inaccurate scale being in unstable equilibrium.

The general figure of 56 percent of newly installed scales complying with SR requirements may be compared with the similar figure for all remaining motortruck scales; this figure is 53 percent.

While few of the accurate scales were so recently installed as definitely to put them in the class of "new" scales, it will be of interest to determine how many of them complied with the requirements for

Digitized by Google

new scales. It is found, then, that of 19 scales listed as accurate only 6, or some 32 percent, were within the manufacturers' tolerance or tolerance on new scales, while 13, or 68 percent, were not within this tolerance. Seven, or 44 percent of the 16 of these scales to which the SR requirement was applicable, complied with the SR requirement for new scales; the remaining 56 percent did not. Finally, only 2 scales, or 12.5 percent of these 16 scales listed as accurate, complied both with the SR and tolerance requirements applicable to new scales.

Condition of scales.—The general accuracy figures, the general condition surrounding the installations, and the condition of specific scales very recently installed prove beyond peradventure that a great many new motortruck scales are being turned over to their owners in improper and inaccurate condition. This is a severe indictment of the interests responsible for the installation of motortruck scales. It is believed that the manufacturers of the scales turn out from the factory a satisfactory product. While this is a necessary and indispensable contribution toward satisfactory conditions, it by no means tells the whole story. If in the installation of the scale the original accuracy is destroyed, the fact that, as manufactured, the scale was an excellent one is of little consolation to the purchaser who is furnished with an inaccurate weighing machine installed in the pit. It is apparent that until conditions such as these shall have been rectified, there is no logical basis for the slightest hope that a satisfactory accuracy of motortruck scales in use can be realized.

It is not intended to be suggested by the above that every new scale is subject to serious installation faults. It is emphasized, however, that in far too many cases inexpert installation is demonstrated by inspection. Several specific examples may be cited.

The following faulty conditions were found on inspection of a scale which had been installed only about 4 weeks prior to the time the Bureau inspectors visited it. The trig loop at the tip of the weigh-beam was installed in reverse position. The beam rod was considerably out of plumb. Two main load-bearing assemblies were out of plumb. A main-lever fulcrum stand was improperly installed; it appeared that the anchor bolts had not been correctly positioned and that these had been bent to bring the fulcrum stand into approximately correct position, as a result of which the stand was not plumb. This stand was also improperly grouted and had a bearing on the foundation equivalent to only about half the area of the base of the stand. As a result the main lever was thrown out of proper position and there was interference between the tip of the lever and the tip connection. The maximum percentage error on this scale was +0.89 percent.

In the case of another scale turned over to the purchaser not more than 6 weeks before the test was made, the following conditions were reported: Main levers and the transverse extension lever were loose. A main fulcrum stand was not anchored, being neither bolted nor grouted to the pier. Another fulcrum stand was mounted on a board placed on top of the foundation pier, and the stand was out of plumb. The connection at the tip of a main lever was out of plumb. Two anchor bolts for one of the check elements were missing. Parts were improperly positioned, as a result of which main bearings were displaced from proper position on their opposing pivots and were interfering with the main levers. The beam rod was slightly out of plumb.

Digitized by Google

One corner of the scale platform was approximately ¾ inch below the level of the coping. The weighbeam shelf was not rigidly mounted. The maximum percentage error on this scale was +1.08 percent.

The next scale to be cited had been in use 1 week. Main levers and a reversing lever were somewhat out of level. Clearances between scale platform and coping were inadequate. Under load, there was a tendency for the weighbridge so to shift its position that under a 15,000-pound load at the left end of the scale there was slight interference between scale coping and scale parts. The foundation for the weighbeam assembly was not rigid and the weighbeam shelf was very loosely mounted. The maximum percentage error on this scale was found to be −0.33 percent.

There is now to be considered a scale in use some 8 months. In this case inspection disclosed that the transverse extension lever was improperly mounted, as a result of which there was probaoly some interference around the fulcrum pivots. One main lever appeared to be improperly positioned, causing interference in the connection at the tip of the lever. This scale had a maximum percentage error of −1.12 percent.

The next scale was installed about 4 months prior to the Bureau test. It was found on inspection of the scale that this had been well installed except that two main load-bearing assemblies were badly out of plumb. This condition was so bad that when a 15,000-pound load was applied to the right end of the scale, this caused the platform to shift to the near side into contact with the coping; when this load was removed the scale platform returned to its former position. This condition was undoubtedly caused by improper positioning of parts. At the conclusion of the test there was a zero balance change of +20 pounds. The maximum percentage error in this case was +0.30 percent.

Another scale had been in service about 4 weeks. Before the test was started the weighbeam balance ball assembly was raised in an effort to reduce the SR of the scale to a value within the prescribed limit; this adjustment, however, only reduced the SR from 20 to 15 pounds at zero load, and at a 15,000-pound load the scale was found to have a 20-pound SR. The maximum allowable SR was 10 pounds. The following faulty conditions were found upon inspection: Wood supports had been utilized between lever stands and concrete foundation piers. Two main levers were loose. Main levers and the transverse extension lever were somewhat out of level. The connection at the tip of one main lever was badly out of plumb. There was some interference around three of the main load bearings. The beam rod was somewhat out of plumb. Old planking had been used for the scale platform and this was rough. Approaches to the scale were rough. A maximum percentage error of −0.57 percent was found.

There is now encountered a scale the installation of which had just been completed. It was found upon inspection that the beam rod was slightly out of plumb and that both of the weighbeam extension levers were badly out of level. The nose iron of the transverse extension lever appeared to have been moved from the position determined by the factory sealing operation, apparently in an effort to plumb the connection between the transverse extension lever and the first weighbeam extension lever. The second weighbeam extension lever had been broken and temporarily repaired. Other levers in the pit were

Digitized by Google

slightly out of level and one load-bearing assembly was somewhat out of plumb. Before the application of the strain load the scale was found to have shifted its zero balance by −15 pounds; it was rebalanced before the test was continued. At the conclusion of the test a further balance shift of −16 pounds was noted. During the progress of the test the weighbeam balance ball assembly was raised to the upper limit of its travel, thus reducing the SR of the scale from 20 to 14 pounds on a gross load of approximately 30,000 pounds. The maximum allowable SR was 10 pounds. The maximum percentage error was +0.45 percent.

The next scale had been in use 8 months. The following faulty conditions were found on inspection: The main levers were out of level. At one end of the scale, parts were not properly alined and there may have been interference resulting from this condition. The transverse extension lever was improperly mounted, with possibility of interference around the fulcrum pivots of this lever. The weighbeam shelf was not rigidly mounted and was out of level, and in consequence the weighbeam assembly was also out of level. The maximum percentage error developed was +0.67 percent.

The next scale had been installed about 9 months. It was found on inspection that the lever foundations were in bad condition; at one point the concrete was broken and crumbling badly. A main lever and the weighbeam extension levers were out of level. One main load bearing assembly was out of plumb. Loose balancing material was found in use at both the butt and the tip of the weighbeam to effect the zero balance of the scale. The approach at the left end of the scale was sharply inclined to the scale platform and the concrete surface was in bad condition. At the conclusion of the test the scale was found to have shifted its zero balance by +35 pounds. Before the test was started the weighbeam balance ball assembly was raised to the upper limit of its travel; this resulted in reducing the SR from 20 to 15 pounds at zero load. The maximum allowable SR on this scale was 10 pounds. The maximum percentage error determined was +0.37 percent.

The last scale to be mentioned was installed by a city, as a public scale, 9 months before the test. To correct this scale, which had a maximum percentage error of −0.24 percent, the following steps were taken: The connection at the tip of one main lever was brought into proper vertical alinement, a loose main lever was tightened, the weighbeam balance ball assembly was raised in an effort to reduce the SR of the scale, the fractional weighbeam poise was adjusted, and nose-iron adjustments were made.

In order that it may be perfectly clear that the above 10 scales do not represent some unusual condition in some particular section of the country, it may be said that the scales in question were located in nine different States. Three of the scales were automatics, the remaining seven being beam scales. Five each were of straight-lever and torsion-lever type of construction. Six of the scales were installed by manufacturers' representatives; of the remaining four, two were said to be installed by "contractors," one by a "local scale man," and one by "owner." The average period elapsing since installation of all of these scales was slightly over 4 months. The numerical average of the maximum percentage errors was 0.60 percent—three times the basic tolerance allowable.

Digitized by Google

Remedies suggested.—In view of the facts which have been detailed it should be apparent that it is imperative that fundamental and thoroughgoing improvements be effected if present conditions are to be corrected. Two concomitant remedial steps are offered for consideration.

First, adequate official inspections and tests must be provided for and they must be promptly and unrelentingly carried out and applied to all new installations. Inspections might well begin during the progress of the work; upon its completion a final complete inspection and a thorough acceptance test should be made so that the purchaser can be assured that the new scale has been properly erected and is weighing accurately before the purchase contract can be considered as complete. In ordinary cases involving contracts the old legal maxim of "Caveat emptor"—"let the buyer beware"—may be applicable; the buyer must satisfy himself as best he can that he has procured that which he has contracted for and must suffer if he fails to do so. However, scales to be used for commercial purposes may be said to be in a quasi-public status. Inasmuch as the owner may be liable to criminal prosecution for the use of a weighing machine not conforming to the official standards set up, there is certainly a moral responsibility on the State to protect the purchaser from unwitting violation of the law.

Second, the interests responsible for installations must be built up to a very much higher plane of efficiency than appears to obtain at present. It cannot be too strongly emphasized that a thorough house cleaning is in order. When the installation is made by the manufacturer it behooves him to make certain that the care exercised in the production in the factory will not be nullified by careless or inexpert work on the job. When the installation is made by the buyer or by a local scale man the responsibility is divided and it is not so easy to suggest how matters can be improved—but improved they should be. Perhaps the situation could be ameliorated by the passage of laws requiring the licensing of scale installers and repairmen, a subject which has recently had considerable attention from scalemen. A proper law intelligently administered might be found helpful in improving workmanship in both of the instances mentioned above. Additional safeguards come to mind. The manufacturer, it seems, might furnish with each scale detailed general and special instructions as to installation to guide the man on the job, whether or not this man is his employee, the employee of the owner, or an independent contractor. He might furnish a booklet containing suggestions as to proper maintenance to assist the owner to keep his scale in satisfactory condition, and he should emphasize the importance of this. Finally, he would furnish a worth-while service if he would carefully check over the completed job, whether it is his responsibility or that of another, and follow it up until assured that everything is in order.

The two remedial procedures mentioned above should be pushed forward at the same time. Neither the one nor the other can confidently be depended upon to secure the results desired. The inspection and test by the official cannot of itself be sufficient in the very nature of things. It is not the function of the State to install scales; the State is charged only with the duty of seeing to it that they are correctly and accurately installed. Even if general improvement in

Digitized by Google

installation practices is brought about, this will not insure accuracy in the case of any particular job; moreover, it cannot be determined what success is being attained by the second agency without the interposition of the first. Faulty installations will still be encountered; moreover the installer will not ordinarily have the sufficient load of test weights to enable him authoritatively to certify that the scale is weighing accurately at all points. Public policy and efficiency both demand that an adequate testing equipment and a competent certification of accuracy be furnished by the government authorities.

Mr. A. A. REED. Mr. Chairman, I have come a long way to attend this Conference, principally for the purpose of getting the information that has just been given. I hope to be able to report to Oregon some of the things that have been developed here, and I believe that the other States that have not yet been visited by your heavy-duty equipment will need the assistance that you are giving at this time. It is our duty, particularly in this case, to convince the legislators that these conditions described actually exist and that in our State they need improvement. In about 6 months our legislature will meet, and I wonder if it would not be possible to have this Conference report so that our committees might be benefited.

Mr. HOLBROOK. Mr. Chairman, we will get it out as early as possible.

PROGRESS MADE TOWARD PROCURING ADEQUATE VEHICLE-SCALE TESTING EQUIPMENTS

REMARKS OF C. L. KLOCKER, INSPECTOR OF WEIGHTS AND MEASURES, STATE OF CONNECTICUT

Mr. Chairman and fellow delegates, I will try to show you the perfect field test equipment. We have copied it in large part from the National Bureau of Standards unit and we are very much indebted to Mr. Horton and Mr. Crouch who happened to come through our State about the time we had it built and who gave us some very good ideas for the equipment. The motion picture shown by the National Bureau of Standards illustrates exactly the way our truck operates. Our truck is a three-axle truck, both rear axles being driven. We have five speeds ahead, and although we have very steep hills we have never used the low gear. In the lockers, or compartments, in the rear we have twenty 50-pound weights, 10 in each, making in all 1,000 pounds in 50-pound weights. In another compartment [indicating] we carry our equipment.

We carry eighteen 1,000-pound weights. The legislature contemplated last year raising the gross weight allowed on the highways from 40,000 to 50,000 pounds. If they do this, we can arrange to carry additional 1,000-pound weights to make the gross weight of our truck 48,000 pounds. The chassis weighs about 14,500 pounds and the crane weighs about 4,500 pounds.

Now, I think we made one mistake; this is in regard to the wheel base which is 190 inches. This is somewhat too long; you can get it on an 18-foot platform but you cannot get it on a 15-foot platform. Then in the back we made another mistake. You will want all the room you possibly can get between the back of the truck and the end of the boom. If we had more clear space here it would be a great deal of help. With this crane we must turn the weights sideways before we can set them on the platform.

Digitized by Google



FIGURE 8.—*General view of the large-capacity scale-testing equipment of the State of Connecticut.*

Digitized by Google

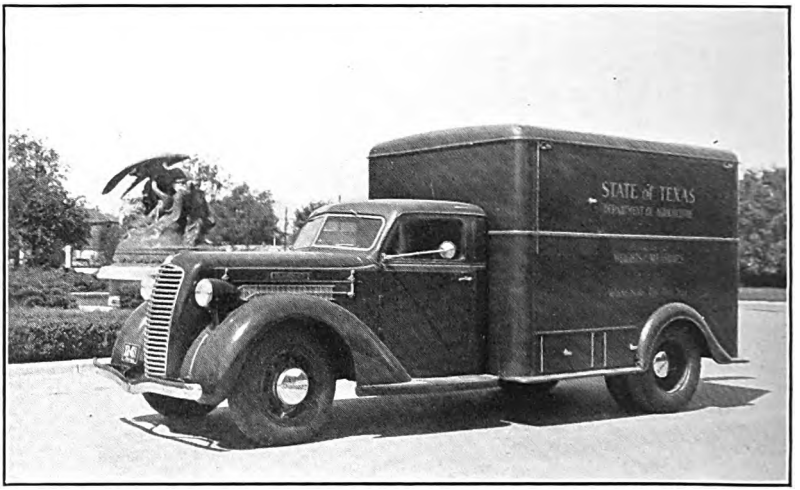


FIGURE 9.—*General view of large-capacity, scale-testing equipment of the State of Texas.*

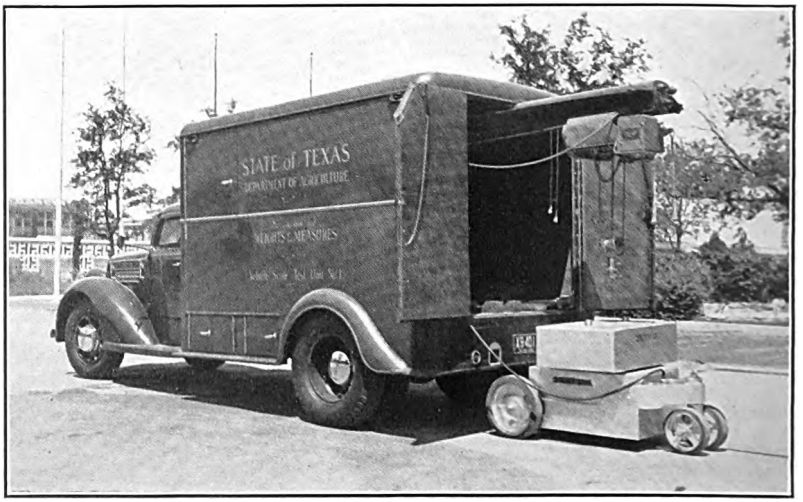


FIGURE 10.—*Another view of Texas equipment, showing hoist and weights.*

Digitized by Google

If any of you people are interested and want any more information on this equipment I will be glad to send it, if you will write me.

Up to the present time we have tested over 600 scales. This does not mean rechecking; it means first tests. The last time I figured, about 55 percent of the scales were all right. We have a tolerance of 2 pounds per 1,000 pounds.

(During the presentation of the above paper, several lantern slides picturing the equipment being described were exhibited by Mr. Klocker. See fig. 8.)

The CHAIRMAN. Thank you very much, Mr. Klocker, for these suggestions concerning your experience. This is very helpful.

PAPER OF J. E. LILES, INSPECTOR OF WEIGHTS AND MEASURES, STATE OF TEXAS

Mr. President, members of the Twenty-eighth National Conference, and guests: For several years, it has been the desire of the Division of Weights and Measures in Texas, to secure more adequate equipment, for testing vehicle, and other large-capacity scales. Naturally, there was the problem of securing a sufficient appropriation to obtain such equipment, and largely through the efforts of our Chief, W. S. Bussey, the Forty-fifth Texas Legislature passed an emergency appropriation bill, providing $10,000 for this purpose, which luckily, was the amount requested.

After making a careful survey, it was decided to build two units, each to carry a test load of 6,000 pounds, consisting of two weights of 2,500 pounds each and 20 weights of 50 pounds each. This limit was set for the reason that in Texas the net highway pay-load limit is 7,000 pounds, and the gross highway load limit is 22,000 pounds for pay load and truck. However, all equipment was designed to carry a maximum test load of 8,500 pounds, therefore, an additional 2,500-pound test weight can be added at any time.

Another problem confronted was that of additional personnel to operate the trucks, and, as we had one man already assigned to similar duties, on a smaller truck which was to be replaced, the legislature saw fit to allow only one additional inspector. It then became necessary to design and build equipment that could be successfully and efficiently operated by one man. Hence, it was decided to obtain units that would be completely electrically operated, and such are the units that I will briefly describe, with the aid of a few slides.

In describing the slides it was stated that the trucks are of 3-ton capacity with 156-inch wheelbase.

A 5-kilowatt, 230-volt direct-current gasoline-engine-driven universal generator plant is mounted in the extreme front of the truck body and used to generate the power to operate the various pieces of equipment. Two doors provide ventilation for the power plant. There are separately fused circuits for each piece of equipment, the hoist, the test-weight car, and a motor.

The wheel base of the test-weight car is 47 inches, the rear axle tread is 30 inches, and the front-axle tread is 9 inches. The weight is almost equally distributed between the front and rear axles. The motor is a 2-hp, gear reduction, totally inclosed motor, having a speed of 1,750 revolutions per minute, to 41 revolutions per minute on the output shaft. It drives through a flexible coupling, to a differential. The speed of the test-weight car is approximately 35 feet per minute.

Head room in the body was one of the important factors to be considered. The hoist is of 2,500-pound capacity, and operates on a 7-inch I-beam, permanently mounted in the truck body. The in-and-out travel of the hoist, is accomplished by an arrangement of roller-chain and sprocket drive, powered by a motor sus-

Digitized by Google

pended above the power plant. This motor is a ½-hp. gear-reduction motor, and the arrangement allows an in-and-out speed of approximately 25 feet per minute.

The test-weight car and attached weight is sealed at 2,500 pounds, and a rectangular top weight is also sealed at 2,500 pounds, giving a total test load of 5,000 pounds. With the use of the 50-pound weights, a known test load of 6,000 pounds can be had.

The I-beam extends 46 inches beyond the rear of the truck body, allowing ample room for loading and unloading the weights. There is a hood over this extended I-beam, and when the equipment is not in use, this hood is completely closed.

A remote-control starting switch is provided for the power plant, at the rear of the truck body, accessible from the ground. Another one is mounted on the instrument panel of the plant. Also, the in-and-out travel of the hoist is controlled by pull cords, accessible from the ground, or from any point in the truck body. An extension cord of 110 feet is provided to supply power to the test-weight car. This cord is made up in two 55-foot sections, and under ordinary operating conditions only one section is used. The control for the test-weight car is located in the steering handle and consists of a spring-loaded forward and reverse switch, thus making it necessary for the operator to keep the desired button depressed while the equipment is in operation. If the handle should be jerked out of his hand, or anything else should happen unexpectedly, the circuit would be automatically broken, and the car would stop immediately. The hoist has a variable-speed switch, pendant-cord control. All control switches are spring loaded, as a safety feature.

The specifications and design were compiled by members of the Texas Weights and Measures Division. Each piece of equipment was purchased on separate bids, and the complete units were assembled by members of the division. By following this procedure, and by using standard-stock parts throughout, the total cost of the two units amounted to only $8,000, or $4,000 each.

We run corner tests on all scales. On scales of 10-ton capacity or over, we run both a 2,500- and a 5,000-pound corner test. We also make a build-up test, using the motortruck as the strain load, adding the 5,000-pound test load, making a total of approximately 16,000 pounds. On scales of less than 10-ton capacity, we make a 2,500-pound corner test and a 5,000-pound end test. We only use the 50-pound test weights on vehicle scales when we deem it necessary.

The two units have been in operation since September 15, 1937, and to date over 600 scales have been tested by each. We have had no mechanical trouble whatever with either unit. I have with me some of the report forms which we use; also some additional photographs and other descriptive matter, which I shall be glad to show any of you who care to see them. I thank you.

REMARKS OF CHARLES M. FULLER, SEALER OF WEIGHTS AND MEASURES, COUNTY OF LOS ANGELES, CALIFORNIA

Mr. Chairman and gentlemen, I shall describe our equipment very briefly. It consists of a motortruck and a steel trailer. In the motortruck we carry 4,000 pounds of 500-pound test weights and 2,500 pounds of 50-pound test weights together with the customary small weights. The feature of this outfit is the use of the steel trailer as a known weight. This trailer is sealed to 20,000 pounds and is mounted on a 7-foot wheel base.

Now, when we first come to the scale we utilize the trailer and run it over the platform thereby determining whether the scale is very much out of tolerance, indicating that repairs are needed. If so, it is not necessary to make a more extended test. Otherwise we go on with further tests using the weights mentioned. When occasion arises we can leave the trailer and get around with the small weights

Digitized by Google

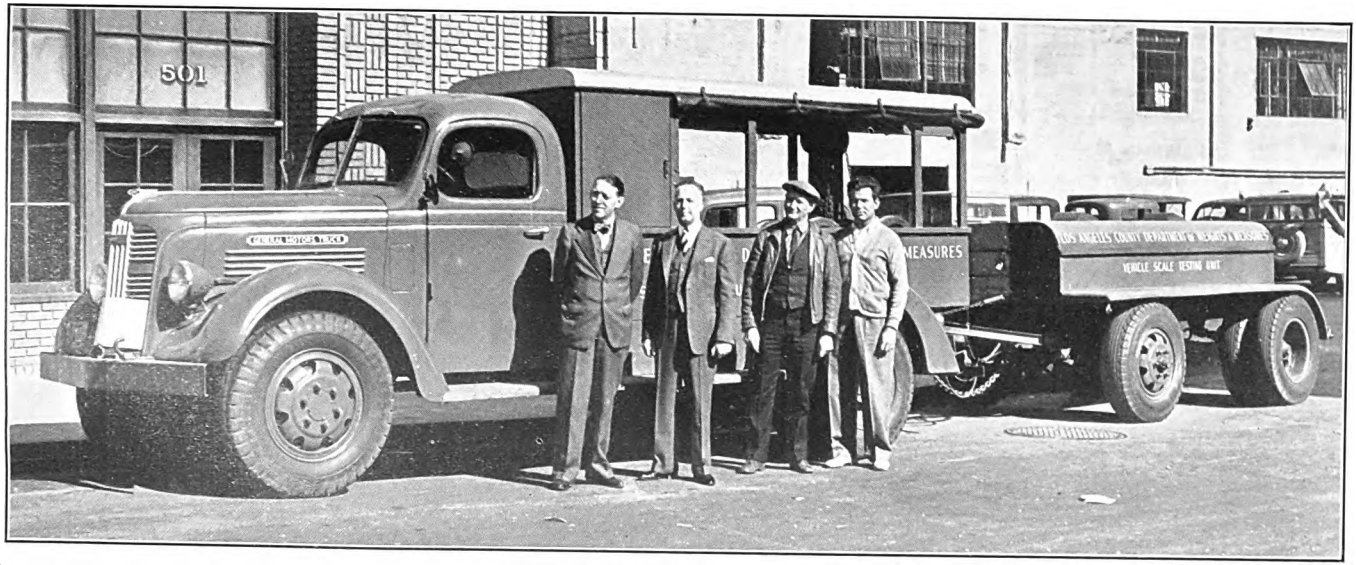


FIGURE 11.—*General view of large-capacity scale-testing equipment of Los Angeles County, California, showing steel trailer standardized at 20,000 pounds.*

Digitized by Google



FIGURE 12.—*General view of large-capacity, scale-testing equipment of the State of Idaho.*

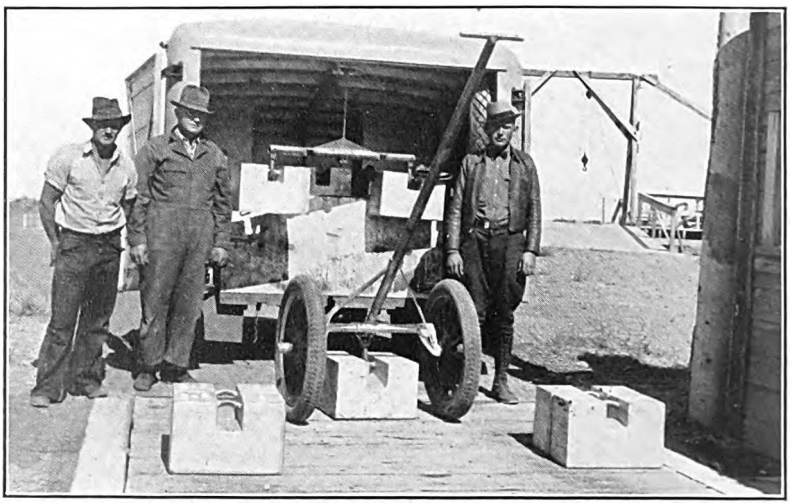


FIGURE 13.—*Another view of Idaho equipment, showing hoisting equipment, weights, and weight-handling cart.*

Digitized by Google

for testing scales other than motortruck scales. This heavy-duty truck equipment has been in use about 2 months, and we find it a veritable lifesaver in covering the field efficiently and with economy. Thank you.

(During the presentation of the above paper a lantern slide picturing the equipment being described was exhibited by Mr. Fuller.)

The CHAIRMAN. The time for adjournment having arrived, I am going to request that you allow me to defer the remarks of Mr. Baucom and Mr. Kanzer, who are also scheduled to speak on this general subject, until tomorrow morning when we will have plenty of time available.

(At this point, at 1 p. m., the Conference took a recess until 2 p. m.)

Digitized by Google

SIXTH SESSION—AFTERNOON OF THURSDAY, JUNE 2, 1938

TOUR OF THE LABORATORIES OF THE NATIONAL BUREAU OF STANDARDS

(The afternoon session of the Conference consisted in the visit to various laboratories of the National Bureau of Standards, particular attention being devoted to the Division of Weights and Measures. Special demonstrations were given in the laboratories, designed to illustrate the character and scope of their activities. In order to make the tour of maximum interest and helpfulness, the delegates and guests of the Conference were divided into small groups, each being in charge of a member of the staff of the Bureau.)

Digitized by Google

SEVENTH SESSION—MORNING OF FRIDAY, JUNE 3, 1938

(The Conference reassembled at 9:30 a. m., at the Washington Hotel, W. S. Bussey, Vice President of the Conference, in the chair.)

The ACTING CHAIRMAN. The meeting will now be in order.

I am happy to announce that we have a very distinguished guest with us this morning, and I want to ask my good friend Rollin E. Meek, of Indiana, to introduce to the Conference the Honorable Henry F. Schricker, Lieutenant Governor of the State of Indiana.

Mr. MEEK. Mr. Chairman and fellow delegates, I take great pleasure in introducing my superior, Lieutenant Governor Henry F. Schricker.

Mr. SCHRICKER. Mr. President, and members of the Conference: I certainly do not want to interfere with your program this morning or offer any excuses for my absence at previous meetings; we let Mr. Meek look after the business. We appreciate the great work you are doing and are especially interested in it. We are proud of Mr. Meek's service in our State and we are grateful for the honor that comes to him from time to time in having a place in your official family. We, who want to serve the people, appreciate the security that is thrown around our people by the services rendered by the department of weight and measure in every State. Under the Constitution, Congress was given the power to fix the standard of weights and measures in this country, so at the very beginning of this Nation we recognized the importance of weights and measures. You are engaged in that business. I congratulate you on your devotion to that duty and look forward to even greater service from you. Thank you.

The ACTING CHAIRMAN. Thank you, Governor Schricker. I am sure we all appreciate having you present on this occasion and the interest you have shown in weights and measures administration in your State; we know that that influence will reach far beyond the borders of the Hoosier State.

PROGRESS MADE TOWARDS PROCURING ADEQUATE VEHICLE-SCALE TESTING EQUIPMENTS—Continued [1]

REMARKS OF C. D. BAUCOM, SUPERINTENDENT OF WEIGHTS AND MEASURES, STATE OF NORTH CAROLINA

Mr. President, and gentlemen of the Conference, I will cut my remarks down to just one or two points.

We are developing and there will be delivered to us in the next 30 days a test outfit with 11,000 pounds of weights. The weight of the truck will be about 9,500 pounds, making a total gross weight of 10 tons. This is to be delivered in the State fully equipped and demonstrated to our satisfaction for a little less than $3,500.

This will be a one-man operated outfit. All of the controls for the power operations will be accessible to the operator standing on the

[1] For the preceding material under this heading see p. 94.

Digitized by Google

ground at the side. We know this outfit is the only one of its design anywhere. We will be glad to go into details with any of you who may be interested in purchasing one, after we get back to the office. I thank you.

PAPER OF BARNETT KANZER, DIRECTOR, BUREAU OF WEIGHTS AND MEASURES, STATE OF NEW YORK

I prepared my paper yesterday afternoon. It is fairly lengthy and I will have to apologize for its length. I know we are pressed for time and yet I know there are some thoughts that I think should be developed and explained, so you will excuse me.

In early February, for the first time in New York State, a request was made by me to my commissioner that $25,000 be appropriated for the purchase and use of a vehicle-scale testing equipment. Neither the commissioner nor anyone else whom I later contacted knew at first what I meant as they had not seen such an equipment. It was necessary to produce pictures.

My next step was to show the necessity of such an equipment. There were only 4 weeks left before the legislature adjourned. Quick action was necessary. The idea was sold to the Commissioner and my other supervisors, a bill had to be drawn in the Bill Drafting Bureau, the staff of the Director of the Budget was convinced and then the senators and assemblymen, and then final steps were taken to be sure the Governor was correctly advised of the necessity of such appropriation. As you know, this was a year of economy and an item of $20,000, which had no direct revenue-producing features, was very closely scrutinized.

In about 3 weeks I was given definite assurance of the passage of the appropriation. I then became somewhat bold and advised the Director of the Budget that I would return next year to ask for at least two more such test trucks and possibly three or four more to include two smaller-size trucks. To me it was a question of mental arithmetic. Figuring on the basis of 1,500 to 1,800 scales that could possibly be tested in a year by one truck, and with a probable number of over 8,000 scales, it would either take 5 years to make one round of tests or preferably have five trucks make one test per year.

At the present time I have not all the details of the truck. It will be ready, I hope, for our 32d annual convention at Buffalo, N. Y., July 19–21, to which you are all invited. You see we in New York State have had four more annual conventions than has the National Conference.

All I can say is that the truck will be the "last word." The experience of other States and their own criticisms of their own equipments were fully noted. I want to say at this time that I am deeply indebted to every State, city, and county that helped encourage me and give me every detail requested. The National Bureau of Standards was also very helpful, and I appreciate the assistance and advice given by all.

In the rough, there will be 20,000 pounds of weights (18,000 lb in rows of three 1,000-lb weights and 2,000 lb in smaller weights). The height will not exceed 9 ft 3 in. and will probably be a few inches lower. It will be completely power-driven with a silent hoist. It will be of the open type, with the cab back of and not over the engine. Two men will go with the equipment.

Digitized by Google

However, in my elation and happiness at the service to be given the public by our Bureau by such a truck, a discordant note has crept in within the last 2 months and more so within the last 24 hours. My enthusiasm is somewhat dimmed.

To begin with, I attended the National Scale Men's Convention at Chicago in March. I desired general information and specific information from expert scalemen on specifications and tolerances for vehicle scales. Even before I reached Chicago I had received some mail asking for my opinion of the relative merits of 0.2 of 1 percent and 0.4 of 1 percent tolerances. I replied, naturally, that I myself was looking for information and light.

Well, at the convention it seemed to me as though resolutions were being brought up here and there on the floor about 0.2 of 1 percent and 0.4 of 1 percent tolerances and a lot was being said about the inaccuracy or danger resulting from the National Conference adopted tolerances. Being ignorant of it all and groping in the dark I decided, after a great part of the session had been used up in talks and resolutions, to introduce my own resolution that a committee be appointed to discuss the proposition with the experts at Washington. This resolution was passed and such a committee appointed.

It seemed to me as if I had just arrived at the first session here when I heard something about another set of tolerances to replace those adopted last year and followed by a number of States. Of course, New York State, not having such an equipment, had adopted no such specifications and tolerances.

Well, I naturally want to help the 13,000,000 people in New York State and to use my equipment to the best advantage. Instead, some confusion was creeping in. A specification called 2q something, with a subbase, I think, was read. I paid close attention, but to the best of my knowledge I heard something that spoke of tolerances being 0.1 of 1 percent and 0.2 of 1 percent in one instance, and 0.2 of 1 percent and 0.4 of 1 percent in another instance, and some changes if the scales were new scales or old scales, and about certain corner tests and, in such instances, a mean error or algebraic mean error then was to be determined.

I do not desire to be critical, certainly not personally critical; I am expressing my feelings and reactions and seeking advice and information. I also have in mind the ability of the average weights and measures official working in the field.

Then all of a sudden I heard a voice saying "We are not satisfied—we are not getting what we want," and something was then said about a Friday session, etc. The man next to me whispered in my ear that the dissatisfied man was a well-known scale expert. At any rate, I was getting confused.

Here was I who had just publicized the fact that the State had made progress in appropriating $20,000 for a device and I wanted to make public how I was to make tests of the scales in my State. I found myself bewildered. Questions arose in my mind when is a scale "new." I once was told that if a new automobile was run around a block it became a used car. Was a scale in the same category after running my own test truck on it for test? I had heard that the tolerances on new scales were different from those for old scales, about one-half as much, and that that also applied to repaired scales.

Digitized by Google

Then, what happened yesterday? Mr. Holbrook gave an interesting and instructive analysis of tests made on new scales, and what did we hear? (I hope I have my figures right. I wrote them using the reflected light of the screen.)

Scales tested that were installed in the year of test—in some instances just installed, and in some instances installed a week to 8 months before—were found inaccurate to the extent of 19 out of 23, or an 82.6-percent inaccuracy, whereas scales installed within the year previous showed 33 inaccurate out of 48 tested, or an inaccuracy of 68.8 percent, nearly 14 percent better than the new scales; the accuracy of 463 scales installed prior to this showed an inaccuracy of 74.3 percent, 8 percent better than those installed within a year and only 6 percent worse than those installed in the year preceding the year of test.

I could not then fathom the reason for permitting the tolerance on a new scale to be one-half that for an old scale. Something appeared wrong or unexplainable to me. I was left out in the cold and the enthusiasm for my new equipment took a decided drop. Why did I have $20,000 of the taxpayer's money spent on a new testing equipment? Why should I condemn old incorrect scales to have them replaced by new, still more incorrect scales? Mr. Holbrook further advised us that many of these new installations had errors two to five times the tolerance. That was all bewildering to me. It did not look good in print; yet the truth must be told; it is a severe indictment of someone or something. If all the efforts in condemning old scales will only bring worse results, I had some tall explaining to do in New York State.

Then I remembered, too, that in my State, and I think in most States, the law permits an error of 30 pounds per ton on coal deliveries and 150 pounds for 5 tons of coal. That brought me back to the apparent inconsistency with the differences of opinion as to 0.2 of 1 percent or 0.4 of 1 percent tolerances.

Well, gentlemen, I am soon to have my new vehicle-scale testing equipment. I want to go ahead and use it. The equipment proper, costing about $13,000, must not lie idle. As yet I do not know what is the exact number or subnumber or subletter of that which refers to tolerance. I wonder if I can forget corner tests and just make an end test, or must I be stuck in a corner? Please advise me how I can advise the 250 weights and measures officials in my State (some of whom get the munificent sums of $100 to $500 a year) how to compute the mean error as against a plain or real error, especially if some of them have little, if any, education. I feel that on the average we have the equal of any State in the Union (Mr. Ralph Smith told us of the weights and measures official who put a lead seal on a weigh-beam). Then, above all things, how shall the weights and measures official make the best approach to a coal merchant when he has to advise him that his scale is all right in every way, except that the sensibility reciprocal is either too large or has some other defect that needs improvement or jacking up? I am going to be very proud of my beautiful vehicle-scale testing outfit, and I want to send out my men with definite instructions for testing such scales. I do not want to confuse them, the public, or owners of scales with a conglomeration of words and terms such as 0.1 of 1 percent, 0.2 of 1 percent, 0.4 of 1 percent, new or manufacturers' or newly repaired or old-scale toler-

Digitized by Google

ances, tolerances for scales with or without ratio, that is, with or without removable weights, tolerances for scales with good or bad corners, mean errors or algebraic mean errors or not so mean errors, sensitiveness with or without its reciprocal, etc., etc. Please simplify these matters for me. What shall I do when experts cannot agree?

The National Bureau of Standards is the greatest institution of its kind in the world. We in America are proud of it. The personnel is of the highest; I also feel that but for a few instances they are far underpaid for their great ability. I have sought and will seek more often in the future their technical and scientific advice. They have always been ready to help me. What I am making a strong and urgent plea for is that they in some way put forth an edition or simplification of the specifications and tolerances so that the average weights and measures official as we know him will understand readily. I assure them and you that although I am a college graduate having specialized in a scientific mechanical course with a B.S. degree, I find difficulty in digging through a maze of varied tolerances for scales under varying conditions and other similar type specifications.

I wonder if it is not possible to do this? I am not critical. I hope I am making a constructive suggestion, helpful for us who have to go out and test scales, weights, and measures and then have to explain to the average merchant what specification or tolerance has been violated so that he will understand what we are saying in the "language of the street." I sincerely and earnestly offer the cooperation of the State of New York.

Mr. HOLBROOK. Mr. Chairman, what Mr. Kanzer is going to do in the case of sealers of weights and measures who do not understand the meaning of a value expressed as tenths of a percent I am sure I do not know, because in this event they certainly will have difficulty in testing vehicle scales, or in fact, any kind of scales. I think if we could sit down with Mr. Kanzer that we could get some of these matters that trouble him very well straightened out. Because of the fact that he has not had a vehicle-scale testing equipment up to the present time he apparently has not studied the regulations of the National Conference in that respect.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES' PRESENTED BY F. S. HOLBROOK, CHAIRMAN, AND DISCUSSION THEREON

Gentlemen: Doubtless you all know that since our last meeting the National Bureau of Standards found it possible to publish the codes of specifications, tolerances, and regulations adopted by the National Conference on Weights and Measures. This new publication is known as National Bureau of Standards Handbook H22, Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. It supersedes Miscellaneous Publication M85 published in 1929. For the first time in some 9 years we now have the codes complete in one publication. This should greatly clarify the requirements and should thus facilitate our enforcement work.

Your Committee desires to report on several minor editorial changes which were made in the text of the codes of specifications, tolerances,

Digitized by Google

and regulations of the National Conference on Weights and Measures in the reprinting of these codes in this Handbook.

The wording adopted at the Twenty-seventh National Conference, for "Scales—General Specifications, par. B–2w, Shift Test of Scales" was modified to some extent in order to improve the phraseology without changing the meaning of the requirement.

In relation to tolerances for large-capacity scales, it has always been understood that provisos 1, 2, and 3 referred only to scales in use. Before the general rewriting of the scale specifications 2 years ago this fact was clearly brought out. After the rewriting of the specifications in the new form the language did not so clearly indicate this fact. Therefore, for the sake of clarity, it was decided to add the words "in use" so that there might be no misunderstanding of the requirements.

In our tables of tolerances for scales the heading "load" was defined as "The amount of weight on the load-receiving element of the scale." In the usual strain-load test the actual load on the scale platform consists of a strain load, the value of which is not definitely known, and of test weights, the values of which are accurately known. In making a strain-load test the weight of the unknown strain load is balanced out and the tolerance values thereafter applied are those for loads representing the amounts of the test weights added to the platform. In view of this, it appeared that the word "load" in the table headings would be more accurately defined were the word "known" to be used to qualify the word "weight" so as to make the definition read, "The amount of known weight on the load-receiving element of the scale." This will assist the inspector to select the proper tolerance values to be applied. In the opinion of the Committee the meaning was not altered by this change and consequently the material was so printed in H22 in the footnotes to tolerance tables Nos. 2, 3, 4, 5, and 6.

Your Committee believes that these were the only editorial changes of enough importance to warrant their being brought to your attention.

Your Committee recommends that the codes as printed in National Bureau of Standards Handbook H22 be formally adopted by the Conference as the official codes of the Conference to date.

With respect to the resolution adopted by the Twenty-seventh National Conference on Weights and Measures directing your Committee on Specifications and Tolerances to review the specifications for small-capacity spring scales, your Committee would report as follows:

Consideration has been given to reports from a number of sources outlining difficulties experienced with the scales in question, which it appears are usually encountered in the case of scales of inexpensive construction designed primarily for the use of peddlers and hucksters. An examination has been made of samples of this type of scale as made by a number of manufacturers, and your Committee is of the opinion that there is need for improvement in the construction of many scales at present on the market. It appears to your Committee, however, that the situation can be very materially improved, and perhaps adequately controlled, by the vigorous enforcement, by weights and measures officials, of existing specification and tolerance requirements without the necessity of adding to the specifications detailed requirements as to design, materials, and methods of fabrication. The particular specifications which your Committee recommends be invoked

Digitized by Google

in this relation are General Scale Specification paragraphs B–2b(1) and B–2u. The former paragraph embraces the general requirements for strength, permanency, and maintenance of accuracy, and reads as follows:

A scale shall be of such design, construction, and materials that it will support a load of its full nominal capacity without the development of undue stresses or deflections in the parts, and that it may be expected to withstand normal usage without undue impairment of its accuracy or the correct functioning of its operating or indicating parts; it shall be reasonably permanent in its adjustment and shall repeat its weight indications correctly.

The second paragraph referred to deals with the facilitation of fraud, and reads as follows:

A scale shall be of such design and construction that it does not facilitate the perpetration of fraud.

Your Committee further believes that much will be accomplished toward the weeding out of unsatisfactory scales of the type under discussion if the tolerances are strictly observed in the tests made, including, of course, the application of the manufacturers' tolerances in case the scales being tested fall in the category of new scales.

A further recommendation of your Committee in this relation is that wherever it is possible to do so under existing authority, the weights and measures official test and inspect scales of the class under consideration while these are in the hands of the local scale dealer, and before they have been purchased by the intended user. If this be done, the official will be able to keep out of the channels of trade all scales which fail to meet the requirements on initial examination. In addition to this direct result, it is believed that the elimination of faulty apparatus at its local source will be a strong incentive for the local scale dealer to stock scales, the large majority of which may reasonably be expected to receive the approval of the weights and measures official.

If the official is at present without authority to examine apparatus in the hands of a dealer, before this has been sold for commercial use, it is recommended that consideration be given to the advisability of appropriate steps to secure that authority so that the plan outlined above may be followed.

If it be found that the vigorous enforcement of the two specification paragraphs cited and of the appropriate tolerances fails to correct the present evils caused by poor design and cheapened construction of certain small-capacity spring scales, the Committee on Specifications and Tolerances will then be prepared to reopen the matter of a stiffening of the specification requirements.

Certain detailed amendments, which are in your hands, in the codes of specifications, tolerances, and regulations are recommended for adoption.

Respectfully submitted.

(Signed) F. S. Holbrook, *chairman*,
Charles M. Fuller,
Joseph G. Rogers,
John P. McBride,
George F. Austin, Jr.,
Committee on Specifications and Tolerances.

Mr. Holbrook. I move that the Codes of Specifications, Tolerances, and Regulations as printed in the National Bureau of Stand-

Digitized by Google

ards Handbook H22 be formally adopted by the Conference as the official codes of the Conference to date.

(The motion was seconded.)

The ACTING CHAIRMAN. You have heard the motion made and seconded. Is there any discussion?

[SECRETARY'S NOTE.—At this point a question in relation to tolerances on corner test of vehicle scales was raised and a motion was made to change the tolerances, as an amendment to the motion to adopt the codes as printed in National Bureau of Standards Handbook H22 as the official codes of the Conference to date. After some debate, the amendment was withdrawn to be renewed when the subject of vehicle scales should have been reached in due course in the consideration of the report of the Committee. In the interest of clarity the material has been rearranged somewhat so as to present at one place in this report the arguments in relation to tolerances on vehicle scales. See page 115.]

Mr. O'KEEFE. This particular book has been printed and distributed. Why are we voting on it?

Mr. HOLBROOK. Because, while it has been distributed by the Bureau, this Conference has not as yet officially adopted it.

The ACTING CHAIRMAN. The question is upon the motion to adopt Handbook H22 as the official handbook of the specifications and tolerances of this Conference. Each official delegate is entitled to vote upon this subject and we will ask for a rising vote.

(The question was taken and the motion was agreed to.)

Mr. HOLBROOK. I will now read that portion of the report of the Committee which deals with the amendments to the codes of specifications, tolerances, and regulations of the Conference proposed by the Committee.

You will note that certain portions of the specifications are underlined; this indicates nonretroactive material. [Reading:]

SECTION ON VEHICLE TANKS

Specification No. 5, under the heading "Vehicle Tanks," reads as follows:

5. FILL OPENINGS AND INDICATORS.—*The minimum dimension of the fill opening shall be 10 inches.* An indicator shall be provided within the fill opening of each compartment; *this indicator shall be permanently attached to the shell of the compartment* and shall be located approximately midway between the ends of the compartment. The indicator shall be so designed that it will clearly, distinctly, and unmistakably define the height to which the compartment must be filled in order to contain its marked capacity, *and the surface upon fill of the compartment shall be so reduced in area that the change in height of the liquid surface at the index of the indicator equivalent to the volume representing the tolerance on the compartment capacity shall in no case be less than 0.04 inch.* If this indicator is adjustable it shall be so constructed that it can be sealed in such a manner that its position cannot be changed without destroying or mutilating the seal.

Amend this specification to read as follows:

5. FILL OPENINGS AND INDICATORS.—*If the fill opening is circular its minimum effective diameter shall be 5¾ inches, or if other than circular, it shall have an equivalent minimum effective area (24.85 square inches); Provided, however, That the fill opening shall be of such size that it can readily be determined whether or not the compartment has been properly filled or completely emptied, as the case may be, and that the attachment of the seal can be readily accomplished when such sealing is required by the terms of this specification.* An indicator shall be provided within the fill opening of each compartment; *this indicator shall be permanently attached* and shall be located approximately midway between the ends of the compartment. The indicator shall be so designed that it will clearly, dis-

Digitized by Google

tinctly, and unmistakably define the height to which the compartment must be filled in order to contain its marked capacity, *and the change in height of the liquid surface at the index of the indicator equivalent to the volume representing the tolerance on the compartment capacity, shall in no case be less than 0.04 inch. An adjustable indicator and any removable part to which any indicator may be attached shall be so constructed that it or they can be sealed in place in such a manner that their position cannot be changed or that they cannot be removed without destroying or mutilating the seal or seals.*

This provides that where the fill openings are circular the minimum effective diameter shall be 5⅝ inches—nominally 6 inches—or shall have an area of 24.85 square inches, which is computed from the diameter of 5⅝ inches.

Last year the Conference adopted an amendment made from the floor, fixing the minimum dimension of the fill opening at 10 inches. The argument advanced for the increase in the size was to insure that the indicator might be readily sealed in place. Officials have succeeded in sealing the indicators in place in the case of tanks which have the standard openings, usually called the 6-inch opening and the 8-inch opening. It seems improper for this Conference to specify a dimension that is going to destroy a line of standardized openings for the mere ease of sealing, an operation which occurs perhaps only once a year or even less frequently than that.

Another amendment to this specification made last year was that the indicator be attached to the shell of the compartment. In order to attach an indicator to the shell the indicator usually must be made excessively long, and attached horizontally, with the result that it may be bent, usually downward. It seems that the indicator should be allowed to be attached to any part of the vehicle tank provided that that part of the tank, if removable, be sealed in place so that the height of the indicator cannot be changed or it cannot be removed without breaking the seal. In this event the situation is effectively controlled. The remainder of the changes in the specification are intended merely to improve the language.

Mr. KANZER. I said earlier this morning that I wondered if we could not get at these things in a little plainer way so that the weights and measures officials out in the field could understand them. During the last year we had a specification requiring that the diameter of circular openings be 10 inches. That proved very successful but now we propose changing that and I question if it should be changed. I do not know how that 5⅝ inches was derived; maybe there is some very technical reason for it. But why not specify a 5-inch opening? The opening may have an equivalent minimum area of 24.85 square inches. I do not know who will go to the trouble to determine what the effective area will be. Why cannot it be made some plain figure like 25 square inches? I know that the area of a circle 5⅝ inches in diameter equals 24.85 square inches, but for the sake of clarity we can specify 24 inches. Then we come down to the change in the height equivalent to the volume representing the tolerance; this shall not be less than 0.04 inch. I do not know of any way that an official ordinarily can determine 0.04 of an inch; he can determine a sixteenth, I think. Therefore, I make a general suggestion without offering a resolution. I think that it should be discussed whether we cannot possibly get into the hands of a weights and measures official something that he understands. If we get it in simple terms I think that we can work more effectively with it.

Digitized by Google

Mr. RAGLAND. Mr. Chairman, last year at this Conference I suggested this amendment that the minimum dimension of the opening be 10 inches. The Conference approved of it, and I carried it home to my people and my legislature enacted it into a law and therefore a change here will not affect me in my own jurisdiction. I visited the big oil industry in my jurisdiction and presented them with the code and said, "If there is anything in this code that does not suit you, I would be glad to have you tell me of it and will consider it." Up to the present time no oil company has made any request for a change.

Mr. GRIFFITH. Mr. Chairman, this amendment to the present code requiring a minimum fill opening of 10 inches, which was adopted at the last National Conference, is not retroactive. It does not affect any tank trucks in use prior to the adoption of the 10-inch requirement, but on new equipment it was necessary for the tank truck manufacturers to make their opening 10 inches. Mr. Ragland has cited the physical reason for it. There are others. I doubt if there is any one man in this room—or I will even include the ladies—who could put their hands through a five and a fraction inch opening and seal an indicator properly and securely.

Now, this is of great importance to facilitate your work, because if you are not able to seal properly and securely you might as well not put seals on at all. A 10-inch hole requirement has met with no serious objection by any of the tank-truck manufacturers through the eastern part of the country and some in the west; tank-truck manufacturers from Missouri did write us immediately after the adoption of this code. It seems to me that to reduce the 10-inch dimension would be a step backward. While Mr. Holbrook may not think that the ease and facility of our work is of much importance, I would like to have the opportunity of having the deputy inspector in my office who handles that work tell you some of the practical and actual conditions involved.

Now, to reduce the dimension to 5 inches also presents this difficulty: Everybody knows you can see more through a larger hole than you can through a smaller one. In order to determine how much liquid is in the tank you should have as much visibility as possible particularly when you want to see the bottom of the tank. Now, since this present requirement is not retroactive, but only applies to the new trucks, I think we should absolutely retain it for the advantages of the weights and measures officials in their work.

Mr. BAUCOM. Down in my State we have some two hundred 4,000-gallon tanks operating, and a good many of them are of the single-compartment type. It would be absolutely impossible for the operator to know when that tank is full if you had a 3-inch nozzle in a 5-inch hole. I feel that perhaps it should be amended and I do not know just exactly what should be done and I will not say, but I will address my remarks to that 0.04 inch. Do you know what that means? On an ordinary 4,000-gallon tank truck the tolerance allowed is 16 gallons of gasoline. It is just plumb ridiculous to say that we can determine that that tank truck holds so many gallons when you have 16 gallons represented by 0.04 of an inch, 400 gallons to the inch. I think it should be changed. It might be large enough in some instances now. The truck owner hauls that gasoline at so much a gallon. We get a tax at so much a gallon. If he can haul gasoline and make an error of 16 gallons on each load that means that much for him. If you take

Digitized by Google

200 truck loads a day with a 16-gallon loss in 4,000, you can see how much money that will run into in a day. In that case, they would be protected in short measuring under the State seal. I do not believe in turning that over to them as casually as that. I believe that should be increased from 0.04 of an inch to possibly 0.4 of an inch, or we might leave it up to the Specifications and Tolerances Committee to work it out closer. Everybody knows that every tank in North Carolina must have a 10-inch opening. I think the figures might be made different on tanks of different capacities but for large-capacity tank trucks, 10-inch openings are satisfactory.

Mr. FULLER. Mr. Chairman, in regard to the present amendment, the minimum 5⅝-inch effective inside diameter is in fact a 6-inch pipe opening, and I might say that we have many of those in use at the present time which are calibrated and sealed and give every satisfaction. Remember this is a minimum requirement and remember also that it applies not only to larger sizes but also to compartments having capacities of 150 to 200 gallons. The amendment further gives us all authority we need and if the design of the tank-wagon compartment is such that we cannot effectively calibrate it with a smaller opening then a larger opening may be required. We should not go on record as saying that where a smaller opening will give satisfaction you must have a 10-inch opening. We must be reasonable in these things and this is comprehensive enough to cover any situation which may arise.

Mr. ENGELHARD. The gentleman spoke of 0.4 of an inch. Frankly, I have a decimal scale in my kit, but I do not use it. I doubt very much whether in actual practice we could figure out what 0.4 of an inch is. I think it should be changed to ⅜ or 0.375 of an inch. There is very little difference there.

Mr. LEITHAUSER. Could we require that an indicator shall be so designed that it shall correctly and unmistakably indicate the point to which the compartment must be filled in order to contain its marked capacity within the tolerance as applied, and then do away with all of those fractions of an inch?

It is very desirable to have a 10-inch opening so that we can look in and see what is inside. When there is a 6-inch opening you cannot see in. I have known cases where 200 gallons stayed up in the front end of the truck where they had a 6-inch opening on a 1,500-gallon tank.

Mr. HOLBROOK. Mr. Chairman, there is already in the specification the requirement that the indicator must clearly and unmistakably define the height of filling but that is not a definite direction to the manufacturer because every weights and measures official might have a different opinion.

It seems that some of the members are talking about tolerances already established, which are not now in question. It is the opinion of the Committee that 0.04 of an inch is an amount which can be readily observed by anyone. If we attempted at this time to change this figure from 0.04 inch to 0.4 inch I do not know what we would do to the vehicle-tank industry.

Now, as to the fill openings: The diameter of the standard fill openings are 5⅝ inches and approximately 8 inches, a little less. Can indicators be sealed in these openings? Mr. McBride, of Massachusetts, Mr. Rogers, of New Jersey, Mr. Austin, of Detroit, and Mr.

Digitized by Google

Fuller, of California, are approving these tank wagons in their jurisdictions. They have been sealing the indicator in the openings. In the opinion of the Committee past experience has proven definitely that they are sealable. That being so it seems to me that we should be satisfied. Gentlemen, I strongly urge against destroying a standard line of apparatus for the mere ease and convenience of the occasional act of a weights and measures official.

Now, as to visibility: The language provides that the fill opening shall be of such size so that it can be readily determined whether or not the compartment has been properly filled or completely emptied, as the case may be. In a case of a very large tank the required size of the opening should be greater than the minimum specified.

Mr. KANZER. Mr. Chairman, I do not think that we are consistent in the way we change these specifications. We have in the first part of the section said, "If the fill opening is circular, its minimum effective diameter shall be 5⅝ inches, or if other than circular, it shall have an equivalent minimum effective area (24.85 square inches)." Mr. Holbrook clearly says that we shall, if possible, give a manufacturer some indication as to how he shall construct any device. That is correct. However, in the same breath they indicate that they are not so very sure of themselves because they go on and qualify it. Now, if the specified opening takes care of the situation, I cannot see the need for that qualifying clause. If the specified opening is not right, then let us have it corrected. The point is that in the specification we set a certain arbitrary, as I put it, combination of figures that we find sooner or later does not work out and then we put qualifying phrases around it to protect it. The very fact that we propose changing it from what we had it last year, 10 inches, shows that very clearly.

I think if you specified 5 inches or 6 inches the weights and measures officials could understand that. Perhaps 0.04 of an inch is a proper distance, but I shall not have it that way. I will tell the weights and measures officials to make it ⅜ or ½ or 1/16, but I will give it in those terms that the men can understand. I do not expect my weights and measures officials to test a tank with a micrometer. If you are going to have tolerances and specifications for the manufacturers' guidance, let us make them manufacturing requirements and let us give to the weights and measures officials something that they can enforce in a practical manner.

Mr. Holbrook honestly says that he does not think that the weights and measures officials are facing a hardship. That is his thought. However, the weights and measures official has thousands of things to do. He is annoyed by a multiplicity of things and he wants to have specifications in such terms that he can readily do the work. You must remember that we have a certain grade level of these weights and measures officials and they are receiving a certain salary—in a number of cases a minimum one. These are laboratory scientific figures. I do not question their accuracy but I do question the possibility of the enforcement of these figures in fractions. So, therefore, I come back to my original thought; wherever possible let us make a certain specification, if necessary, for the manufacturers and then a specification in simple terms for the weights and measures officials. If that is done I will raise no objection but I certainly think that we should have a set of specifications that can be used out in the field by our men.

Digitized by Google

Mr. HOLBROOK. Mr. Chairman, I think Mr. Kanzer does an injustice, doubtless unintentional, to the average weights and measures official when he suggests that they cannot measure in fractions of an inch. As to the argument that 10 inches was adopted last year, this was proposed from the floor of the Conference and it was adopted without due consideration being given to how it might affect a stabilized line of apparatus. Gentlemen, I think such a thing may often occur when there is proposed from the floor of the Conference a figure which is more or less taken out of thin air and which cannot be studied. An injustice may thus be done to the manufacturers of weights and measures equipment.

The figure, 5⅝ inches, is proposed because it is standard in the industry and because it is understood that it has been found to be satisfactory in the past. Then 24.85 square inches is used because that is the area of a circle having a diameter of 5⅝ inches. We cannot change mathematics; we might say 25 square inches or 24 square inches but we can not disturb a mathematical fact. If the weights and measures officer can determine that the area is 24 square inches or if he can determine that the area is 25 square inches, he can just as easily determine that the area is 24.85 square inches, because if he computes his formula accurately that is the answer he will get.

These changes were recommended only after they had received very careful consideration by the Committee on Specifications and Tolerances and I think that you will grant they are experienced men. Specifically in recommending that the figure 10 inches be reduced to the figure 5⅝ inches, the opinion of the Committee is that we are correcting a mistake which was made by the Conference last year due to the fact that the members did not have the opportunity fully to consider the issue at hand.

Mr. BAUCOM. I move that this be referred to the Committee for further study and that they report back next year.

(The motion was seconded.)

Mr. DAVIS. Mr. Chairman, I would like to ask whether these specifications are being written for the manufacturer or for the people who are paying the inspectors? If there is an opening large enough so that the inspector can easily and readily get his tools into it to seal it, money is being saved for the State or the municipality for whom he is working. If you ever tried to read and see the filling point in one of these small openings you would know how hard it is to do it. I certainly am not in favor of too small an opening, and I think a 5-inch diameter opening is too small.

Mr. KANZER. Mr. Chairman, I want to correct one thought that may have arisen from my remarks as to what I think of the intelligence of weights and measures officials. I have the greatest respect for the weights and measures officials. I work with them constantly every day. I think they are the hardest working type of Government officials today. They are far better than the general type of officials as I know them and I would not have anyone read into my remarks any thought that I spoke in any derogatory fashion. I am faced with the fact—and so is every other State official—that you can only get a certain number of what we would call technical men for weights and measures officials and you cannot rise higher than the general level.

Mr. A. A. REED. Mr. Chairman, I want to ask whether or not this 10-inch opening is retroactive.

Digitized by Google

The ACTING CHAIRMAN. My understanding is that it is nonretroactive.

Mr. A. A. REED. Mr. Chairman, before you put the motion to refer the proposed amendment back to the Specifications and Tolerances Committee for another year, I would like to have it understood that we are not voting on the merits of the proposed amendment itself but that we are voting as to whether or not we will refer it back for further consideration.

The ACTING CHAIRMAN. The proposition is to refer it back to the Committee for consideration and further report next year; in the meantime the specification will remain in its present status.

Mr. STROOP. Mr. Chairman, I am a representative of the American Petroleum Institute. So that you will know where the recommendations came from, I want to make it clear that these proposals originated with the operating men in the petroleum industry—our automotive transportation division.

Mr. HOLBROOK. There was a series of amendments proposed to this code, including some eight or ten amendments, I think. The Committee on Specifications and Tolerances gave careful consideration to each amendment in turn. We thought that three or four out of approximately ten, were proper and necessary and recommended these. Six or seven other amendments which were proposed by the industry were not considered to be desirable and no changes were recommended in those cases.

Mr. LEITHAUSER. In regard to accessibility for sealing of these trucks, while it may be true that you have only to do it once in a while, nevertheless we have perhaps 800 trucks in the city of Baltimore so you can see what the problem amounts to.

(The question was taken, and the motion was agreed to.)

Mr. HOLBROOK (reading):

Specification No. 12 reads as follows:

12. RETURN OF INDICATING ELEMENT TO ZERO.—*Meters installed on vehicle tanks shall be so designed and constructed that the indicating element used to tally sales and deliveries to individual purchasers or to indicate the amount delivered when any portion of the cycle or stroke has been completed shall be returnable readily to a definite and clear zero indication before the next delivery is begun. Means shall be provided to prevent the indicating element from being returned beyond the zero graduation. The indicating element may be advanced only by the mechanical operation of the device itself: Provided, however, That the device may be cleared by advancing the indicating element, but in this event the indication shall be obscured and remain obscured, until the zero is reached.*

Amend this specification by adding at the end thereof the following words:

Provided, however, That an element designed for predetermining the amount of a delivery to be made shall not be construed to be an indicating element when such predetermining element is clearly differentiated from the indicating element so that it will not be mistaken therefor.

It has not been understood in all cases in the past whether a predetermining delivery element on a meter was a proper device under the code of specifications as it stands at the present time. The Committee is of the belief that such a device, if properly constructed, is an entirely proper device.

(The amendment as proposed by the Committee was duly adopted.)

Digitized by Google

Mr. HOLBROOK (reading):

14. DISCHARGE LINES.—If the unit be designed for discharge by gravity, the discharge line shall be as short as practicable and there shall be no shut-off valve at its discharge end. If the unit be designed for discharge by means of a pump, the discharge line shall be of the wet-hose type with a shut-off valve at its discharge end, and immediately adjacent to this discharge valve there shall be installed a spring-loaded check valve so adjusted that drainage of the discharge line will automatically be prevented. When two or more compartments discharge through a manifold and the discharge lines are equipped with independently-operable discharge valves, the construction shall be such that deliveries shall be accurate whether or not more than one of the valves are partially or wholly open.

Amend this specification to read as follows:

14. DISCHARGE LINES AND DELIVERY HOSE.—If the unit be designed for discharge by gravity, the delivery hose shall be as short as practicable and there shall be no shut-off valve at its outlet end. If the unit be designed for discharge by means of a pump, the delivery hose shall be of the wet-hose type with a shut-off valve at its outlet end, and immediately adjacent to this valve there shall be installed a spring-loaded check valve so adjusted that drainage of the hose will automatically be prevented. When two or more compartments discharge through a manifold and the discharge lines are equipped with independently-operable discharge valves, the construction shall be such that deliveries shall be accurate whether or not more than one of the valves are partially or wholly open.

The Committee feels that the only effect of the change in the specification is improvement in phraseology. Apparently there has been a misunderstanding as to what constituted the discharge line and what constituted the delivery hose.

Mr. KANZER. Mr. Chairman, I suggest that the words "spring-loaded check" be removed from the specification. I do not ask that as a matter of avoiding trouble with mechanical devices but simply as a matter of good specification writing.

Mr. GRAEFF. Perhaps Mr. Kanzer has overlooked the fact that the omission he suggests would allow the use of a manually-operated valve, only, which is something which we want to guard against.

(The specification as proposed by the Committee was duly adopted.)

Mr. HOLBROOK (reading):

Add a new regulation to be known as Regulation No. 2 and to read as follows:

2. When a vehicle tank is used as a measure, the vehicle shall stand upon a level surface during the filling of the compartments; during a delivery, the vehicle shall be so positioned as to insure complete delivery whenever the delivery is such that a compartment should be completely emptied.

The Committee is of the opinion that when a vehicle tank is used as a measure it should be filled when in a level position and when it is emptied it should be in such a position that the compartment will completely drain. The requirement in regard to delivery merely calls to the attention of the person making it that when there is a grade involved it is often necessary so to position the vehicle tank that there will be complete drainage.

(The regulation as proposed by the Committee was duly adopted.)

Mr. FULLER. Mr. Chairman, before we leave the subject of vehicle tanks, I ask the privilege of bringing up one matter which is of a great deal of importance to all of us. I refer to our present Specification No. 9, "Piping," which has always been highly controversial and which was adopted 3 years ago by the very close vote of 32 to 28.

Digitized by Google

[SECRETARY'S NOTE.—The specification in question reads as follows:

"9. Piping.—Vehicle tanks equipped with control or emergency valves shall have such valves at the lowest point of outlet from each compartment, and the capacities of such compartments shall be construed as not including the capacity of the piping leading therefrom."]

By correspondence, and also by talking with a great many of you here, I find an unfortunate situation exists in that practically half of the jurisdictions follow the specification and gage vehicle tanks with pipe lines empty, and the other half gage them with pipe lines full, because they firmly and sincerely believe that method is the proper one.

At our conference in California last fall we gave this matter a great deal of consideration. We proposed the following amendment to this [reading]:

9. Piping.—Vehicle tanks equipped with control or emergency valves shall have such valves at the lowest point of outlet from each compartment and the capacities of such compartments may be determined as including or as not including the capacity of the piping leading therefrom. Such marking as is provided for under Specification No. 10 of this Code shall indicate whether the measured capacity has been determined as including the capacity of the piping leading therefrom or as not including the capacity of the piping leading therefrom.

In other words, it is optional with the sealer in his jurisdiction as to whether he shall require that piping be excluded or included. You do not put him in the position in which some of them are now, of adopting regulations which are contrary to these regulations. Gentlemen, it certainly is evident to you that when there is such a close division of opinion, when 28 men who are doing practical work in the field believe one way and 32 believe the other way, there is merit in both methods. I do not believe in adopting a National code for use throughout the entire country which is of such a character that half of the men in their own jurisdictions are not enforcing it. This proposal gives every protection needed.

Mr. STROOP. As all members of this Conference know, we had a very interesting session 3 years ago when this action was taken as referred to by Mr. Fuller. You perhaps recall that the American Petroleum Institute Committee on Automotive Transportation recommended that the tanks be calibrated with the discharge pipes filled. We are still of the opinion that that is the method which should be used.

Recognizing that we cannot hope to sway this Conference to our way of thinking, I desire on behalf of our committee to support the proposal which Mr. Fuller has made, thus leaving it with our men in the field to talk the matter over with the sealers of weights and measures in various jurisdictions without prejudice, to find if we can have our operating difficulties simplified in that particular State by so calibrating our tanks.

Mr. RAGLAND. Mr. President, I am indeed unfortunate. I know of no man who attends this Conference that I have a higher regard for than Mr. Fuller, but I was father of this requirement and, gentlemen, to be consistent with my good friends, how can you change this specification when New Jersey and Massachusetts by State laws say that tank wagons with pipe lines full shall not run over the roads? Gentlemen, we are not unreasonable. If the capacity of the pipe line is included in the capacity of the compartment, the driver can close the valves when he fills the tank wagon; he robs the customer of what should be in the line.

Digitized by Google

Mr. J. G. ROGERS. I do not want to take issue with Mr. Fuller and I will not, except to say that it is against the safety laws of our State to have vehicles go over the roads with lines filled. I will, moreover, say that we consider the compartment to be the measure and not the auxiliary pipe. I have always contended that where anything else is included there is always a possibility of mistake either intentional or otherwise. It is also a safety feature.

This has been a controversial question down here for a number of years. If you gentlemen will refer back to the minutes of the early Conferences you will find that we originally had in the code the measurement of these tanks with the lines empty. That was about 10 years ago. Then we made the change when we found that there were some that wanted the lines included in the calibration, and this prevailed for probably 2 or 3 years. Then we went back again to the calibration with the lines empty. The subject seems to have been settled; you gentlemen have gone on record on two out of three occasions that the calibration should be done with the lines empty, and I am sticking to it on that principle alone. It is purely a weights and measures matter.

Mr. FULLER. Mr. Chairman, in order that there may be no misunderstanding, I would say that this proposed amendment makes it optional. It does not propose to change the laws of States where they have decided on the present method; but it will allow the rest of us in any other section who find the method of calibration with line full to be practicable to adopt that method without going contrary to the National code. In many large jursidictions they are gaging vehicle tanks in this manner and they will continue to do so. I have been a practical man in the weights and measures field for over 25 continuous years and nobody can say that I ever advocated any amendment in principle unless I entirely believed that it was right and just.

Mr. BAUCOM. Mr. Chairman, I move that the amendment proposed by Mr. Fuller be adopted.

Mr. J. G. ROGERS. These regulations and specifications are merely recommended for adoption by the several States. If California finds itself in difficulty it need not adopt this paragraph. If you include the pipe line as part of the capacity you are directly inviting fraud and are thereby defeating the purposes of weights and measures administration. You might as well consider the capacity of the spout as part of a measure. I hope you will vote "no."

(The question was taken, and the motion was lost.)

SECTION ON SCALES

Mr. HOLBROOK. We now come to the section on scales [reading:]

SCALES—GENERAL DEFINITIONS.

Add a new paragraph to be known as paragraph A–2q, and to read as follows:

A–2q. NEW SCALES.—Scales which are about to be put into use for the first time or which have recently been put into use and are being tested for the first time by the weights and measures official. Scales which have been reconditioned or overhauled or which have been condemned for repairs by a weights and measures official and subsequently adjusted or repaired shall, upon the first test thereafter, be construed to be "new" scales for the purpose of the application of tolerances.

Digitized by Google

As was reported the other day, the special committee appointed by the National Scale Men's Association had a joint meeting with the Committee on Specifications and Tolerances of the National Conference in relation to the tolerance on vehicle scales. One of the arguments advanced by the National Scale Men's Association Committee was that the present tolerances were such that the standards of the scale repairmen might not be maintained.

This amendment in effect provides that all scales which have been reconditioned or overhauled or which have been condemned for repair by weights and measures officials shall be subjected to the tolerances for new scales. In other words, repaired vehicle scales will take the tolerance of 0.1 percent when the load is on the end of the platform and 0.2 percent when on a corner. After careful consideration it seems to the Committee on Specifications and Tolerances that this amendment does much to meet objections raised to the tolerances on vehicle scales which were adopted last year.

You will remember that only 22 percent of the vehicle scales so far tested by the National Bureau of Standards were found to be accurate, and some 78 percent were found to be inaccurate when the present tolerances for used scales were applied. If this amendment is adopted the tolerance hereafter applicable to repaired scales will be one-half or less of the tolerance applied by the Bureau in its investigation.

(The definition as proposed by the Committee was duly adopted.)

Mr. ROESER. There is a group present representing certain interests, both manufacturing and industry. We have come a long way in this period of severe economic distress and have stayed at the hotels for a week to present an issue.

In order that there may be no confusion about it, I would like it to be understood that this amendment just adopted in no way affects this issue, which is that we do not want a 4-pound-per-thousand tolerance on any scale. It is the opinion of scalemen that where an error of that magnitude is found the scale either needs repairing or replacement. The whole situation would be clarified in the eyes of Mr. Kanzer and everybody who has to do with the maintenance and operation of scales, if you would wipe out this multitude of requirements and require that the error on a vehicle scale under any load should not exceed 2 pounds per 1,000 pounds. Manufacturers can build scales under the terms of that requirement and they can be maintained within that tolerance. It is not proper for me to make a motion on the floor of the house, but I would like to see somebody who is qualified offer a requirement that would permit a tolerance of 2 pounds per 1,000 pounds on the test of a vehicle scale so that we scalemen will know where we stand.

Mr. ENGELHARD. It is my understanding that a tolerance of 0.20 percent is allowed on a corner of a new scale. However, when we find vehicle scales in use, out in the open, exposed to the weather and subject to abuse, and to wear and tear, and to accumulations of dirt, we will tolerate 0.40 percent on a corner. Actually, I do not condemn scales which develop errors in test of 0.50 percent. I believe that with improvements in metallurgy and machine tool design, it is practical to build weighing and measuring devices well within 0.20 per-

Digitized by Google

cent, and so I do not approve of increasing the tolerance beyond 0.20 percent on new devices.

Mr. LEVITT. Mr. Chairman, 2 years ago I came before this Conference and suggested a change in tolerance on motortruck scales because of the fact that we had made a survey of some 200 scales within a radius of 100 miles of the city of Springfield and had found that a large majority of those scales were not within 0.20 percent. I felt like some others that the requirements were a little too rigid and I recommended that the tolerance be liberalized.

Immediately after that we bought a heavy-duty test equipment outfit. I found after our first trip around, that when the repairmen and the manufacturers realized that they had to have proper installation and proper maintenance, it was possible for them to keep a scale within 0.20 percent. I want to say this morning that I was wrong a few years ago when I suggested liberalizing the tolerance and I don't see any occasion for the Conference to take a backward step. If we cannot go forward I do not think we should go backward, and I would like to see the tolerance restored to 0.20 percent.

Therefore, Mr. Chairman, I would like at this time to make a motion that this Conference change the specifications and tolerances for motortruck scales so that a maximum of 0.20 percent on used scales will be allowed and so that the tolerance on new or repaired scales will be one-half of that tolerance, or 0.10 percent. I do this simply because I think it is for the best interest of the weights and measures officials and of the scale manufacturers. I know that the difficulty in maintaining tolerances is largely because of the fact that the repairmen have a tendency to liberalize them. I know from experience that certain pump repairmen and operators, knowing that the tolerance is 7 cubic inches on 5 gallons, do not adjust pumps to zero error but set them 5 cubic inches minus to take advantage of the tolerance. I do not think that there is any representative here who would take advantage of a tolerance like that, but we do know of people in the field who are doing it.

(The motion was seconded.)

[SECRETARY'S NOTE. For the benefit of the reader it may be said that the motion proposed was directed to the amendment of "Scales—General Specifications—Par. B–2w, Shift Test of Scales," the applicable portion of which reads as follows:

"A scale having four main load bearings shall give results accurate within tolerance when a load of one-quarter capacity or less is placed so that its center of gravity lies as nearly as may be over any one of the main load bearings, * * * and when a load of one-half capacity or more is so placed at the center of any quarter of the platform, * * * Provided, however, That in the case of a vehicle scale, the tolerance to be applied to the results on the corner shall be twice the tolerance which would otherwise be applied, but the algebraic mean of the errors on the two corners at each end of the scale shall not exceed such regular tolerance."

The regular tolerance on the end of a vehicle scale in use is 0.20 percent, on a new or overhauled vehicle scale, 0.10 percent. The proviso increases these tolerances to 0.40 and 0.20 percent, respectively, under the conditions set out. The motion then, contemplated the repeal of that portion of the above specification, which starts with the words "Provided, however."]

Mr. HOLBROOK. Mr. Chairman, last year the Conference adopted a maximum tolerance of 0.40 percent,this tolerance to be applied, with certain important limitations, on the corner of a vehicle scale only. The arguments in favor of the adoption of this tolerance are summar-

Digitized by Google

ized in a letter written some time ago, and I would like to read this in part. [Reading:]

I would point out first in this connection that the tolerances adopted by the National Conference are intended for the use of regulatory officials of the States and cities and counties in passing upon the suitability for continued use of weighing and measuring equipment which is under their official control. * * * the only effect of the tolerances to which objection is being taken, would be to permit to remain in service, insofar as official control is concerned, certain scales which would otherwise be rejected, if and when corner errors of certain magnitudes are developed in the test.

I would mention next that there were made available to the National Conference Committee the results of the extensive series of tests of vehicle scales conducted by the Vehicle-Scale Testing Unit of the National Bureau of Standards during the 6-month period preceding the 1937 meeting of the National Conference. A study of these data disclosed that under the original tolerance provisions, some scales would be rejected on the results of the corner tests but that these same scales gave reasonably good performance in other respects. It should be borne in mind in this connection that an individual corner of a motortruck scale is usually not susceptible of a nose-iron adjustment; only the end can be adjusted without grinding the pivots to change lever ratios, an operation which should only be attempted in a shop. It seemed, therefore, that these scales would be unnecessarily penalized, were the original tolerances to be retained.

A very important consideration in this relation, in the opinion of the Committee, is this: In the regular commercial use of a vehicle scale, it is entirely impracticable for the vehicle load to be concentrated on one corner of the platform. In practically all cases the load on any vehicle axle is reasonably well distributed between the two ends of the axle, and the relation between wheel treads and platform widths is such that each corner at either end of the scale bears approximately one-half the load at that end. It follows that if the algebraic mean of the errors on the two corners at one end of the scale is within the original tolerance, the liberalization with respect to individual corner errors will not to any material extent adversely affect the weighing performance of the scale in regular use. In this relation I might cite the National Conference definition of a Vehicle-Scale: "A vehicle scale is a large-capacity scale designed to be used to determine the weight of a motortruck or wagon, loaded or unloaded." It is probably these considerations which have influenced the very considerable sentiment which is growing up to the effect that in the routine test of a vehicle scale the corner test be discontinued and that only an end test be made, except in special circumstances.

The provision requiring the algebraic mean of the errors to be within the regular tolerance is so important that I feel I should interpolate a few words in that regard. The tolerance on the end of a vehicle scale in use is 0.20 percent. The tolerance on an end of a vehicle scale which is new or repaired is 0.10 percent. The tolerance of 0.40 percent on an individual corner of a scale in use is a maximum and is only allowed when the algebraic mean of the errors on the two corners at the end in question is within 0.20 percent. We feel that the tolerance is well under control in that when the axle load of a vehicle is on the end of a scale the weight is necessarily distributed between the corners. [Reading:]

We do not wholly subscribe to the theory that reducing tolerances always results in improvement; when the tolerance is reduced to such an extent that it is very difficult or impossible of rigid enforcement, it is likely to be replaced by the judgment of the person testing, which usually results in increasing the errors which will be allowed. Moreover, it is not infrequently the case that the testing equipment and methods employed are inadequate to develop the errors which are present in the equipment tested. The tolerances adopted by the National Conference are intended to be strictly applied as written, upon the results of an adequate test. When so applied, it is believed that the present tolerances of the National Conference for vehicle scales will not be conducive to the development of reprehensible practices in scale maintenance and will not be found to be prejudicial to the interests of any agency concerned with commercial weighing.

Digitized by Google

Once again, I desire to interpolate. Your action this morning has already very considerably stiffened the requirement on scales which have been reconditioned, overhauled, or repaired. [Reading]:

On the contrary, the modification of the tolerances for corner tests of vehicle scales is one of several modifications recently made, with the view of harmonizing tolerance requirements with actual conditions which exist, not for the purpose of continuing in service scales which are "inaccurate," but to the end that the tolerances may be applied in all cases with the assurance that unwarranted rejections will not be made. In this connection, as a practical matter, it may be said that even after the modifications in tolerances, from 70 to 80 percent of the scales tested by the vehicle-scale testing unit of the National Bureau of Standards were found not to be accurate, a situation which seems to indicate that the tolerances are not too liberal.

Some time ago we analyzed the results of tests on all vehicle scales made by the Bureau equipment from the beginning of the work up to January 1, 1938, to determine the practical effect of the amendment made at the last Conference. It was found that 766 tests on vehicle scales had been made in 16 States and in the District of Columbia. Corner tests were made in the case of 161 of the scales tested. Of these scales only five, or 3 percent, were found which were within tolerance after the doubling of the tolerance on corner results but which would not have been within tolerance before the amendment of the shift test specification.

Now, the question is of enough importance to take the time to analyze the results of these five tests.

(Mr. Holbrook then analyzed the test results of the five scales in question. The performance of these under test by the National Bureau of Standards is detailed in the following. The results starred (*) would not be within tolerance under the requirement of paragraph B–2w before amendment of the Twenty-seventh Conference.)

TEST RESULTS

20,000-LB SCALE. MINIMUM GRADUATION, 2½ LB.
(TEST 196)

Element under test	Test load		Error	
	Position	*Pounds*	*Pounds*	*Percent*
Lever system (ratio)	Left near corner	3,000	0	0.00
Do	Left far corner	3,000	−3	−.10
Do	Left end	6,000	−1	−.02
Do	do	9,000	−3	−.03
Do	Right near corner	3,000	−2	−.07
Do	Right far corner	3,000	−6	−.20*
	(Algebraic mean of errors		−4	−.13)
Do	Right end	6,000	−4	−.07
Do	do	9,000	−6	−.07
Do	Distributed	15,000	−9	−.06

10,000-LB SCALE. MINIMUM GRADUATION, 2 LB.
(TEST 617)

Weighbeam	Right near corner	2,000	−10	−0.50*
Do	Right far corner	2,000	0	.00
	(Algebraic mean of errors		−5	−.25)
Do	Right end	3,000	−5	−.17
Do	do	5,000	+1	+.02
Do	Left near corner	2,000	−2	−.10
Do	Left far corner	2,000	+2	+.10
Do	Left end	5,000	−3	−.06
Do	Distributed	10,000	+1	+.01

Digitized by Google

TEST RESULTS—Continued

8,000-LB SCALE. MINIMUM GRADUATION, 2 LB. (TEST 619)

Element under test	Test load		Error	
	Position	*Pounds*	*Pounds*	*Percent*
Weighbeam	Right near corner	2,000	−7	−0.35*
Do	Right far corner	2,000	−3	−.15
	(Algebraic mean of errors		−5	−.25)
Do	Right end	1,000	−5	−.50
Do	do	4,000	−3	−.08
Do	Left near corner	2,000	0	.00
Do	Left far corner	2,000	−5	−.25
Do	Left end	4,000	0	.00
Do	Distributed	8,000	+10	+.12

12,000-LB SCALE. MINIMUM GRADUATION, 2 LB.[a] (TEST 624)

Weighbeam	Left near corner	3,000	+6	+0.20
Do	Left far corner	3,000	+2	+.07
Do	Left end	1,000	−3	−.30
Do	do	6,000	+10	+.17
Do	Right near corner	3,000	−10	−.33*
Do	Right far corner	3,000	+2	+.07
	(Algebraic mean of errors		−4	−.13)
Do	Right end	5,000	0	.00
Do	do	6,000	+2	+.03
Do	Distributed	12,000	+17	+.14

25,000-LB SCALE. MINIMUM GRADUATION, 5 LB.[a] (TEST 763)

Weighbeam	Left near corner	3,000	−12	−0.40*
Do	Left far corner	3,000	+5	+.17
	(Algebraic mean of errors		−3.5	−.12)
Do	Left end	9,000	−15	−.17
Do	Right near corner	3,000	−10	−.33
Do	Right far corner	3,000	0	.00
Do	Right end	10,000	−15	−.15
Do	Distributed	15,000	−25	−.17

[a] An automatic-indicating device was attached to this scale; the indications of this device are not included in the results given.

Mr. HOLBROOK (continuing): Now, gentlemen, on account of these errors on corners—outside of the tolerance before the amendment of par. B–2w but inside tolerance as a result of the operation of the amendment—would you condemn those scales? In our opinion you would not. We do not believe that there is a weights and measures official in the United States who would believe that it was a proper exercise of his official duties to condemn such scales as those. Moreover, if you did so we think that you would be doing a very grave injustice to the merchants maintaining those scales. These are five of the scales constituting the 22 percent of the scales which were found to be accurate, and so reported yesterday. Does the Conference want to put those scales out of the accurate and into the inaccurate classification? We think not. As conditions are found the

Digitized by Google

owner may well be operating one of the most accurate scales in his community. Whether or not you put the proposed amendment "in the book" as Mr. Brenneman would say, and thus put the scales just discussed in the inaccurate class, we do not believe there is a weights and measures official here who would follow the proposed tolerance and condemn these scales. Yet the tolerances and specifications should be so written that we should be able strictly to enforce them without doing an injustice to anyone.

Mr. LEVITT. Two corners on one side of the scale might each be —0.4, on the other side +0.4 percent. Now, you might drive your motortruck on as close to one side as possible and you will get one weight; if you drive this same motortruck on as near the other side as possible you will get a different weight. That is what I have found from experience. Now, why not have side tests instead of end tests?

Mr. HOLBROOK. We believe in an end test because we insist that when a vehicle is put upon a platform it must of necessity rest on both corners at one end of the scale. There is, we grant, a possibility of getting a slight variation in certain cases through driving as near one side of the scale as possible in the one instance and as near to the other side of the scale as possible in the other instance, but it seems that if that expedient were to be adopted by the user to produce errors, you could proceed against the merchant for fraud.

Mr. LEVITT. There is nothing to prevent him from driving to one side of the scale or the other; I do not believe I could prosecute him.

Mr. HOLBROOK. To my way of thinking, on a platform 9 or 10 feet wide, no considerable error will be caused by driving a vehicle either to the one side or the other. The tread of the motortruck is such that any differences in weight will be small.

The Committee, last year, devised this specification as a result of tests. Upon reviewing the matter this year the Committee feels that it did better than it knew at the time, in recommending this tolerance to the Conference. The Committee is wholly of the opinion that the tolerance is a reasonable and proper one and that a decrease in tolerance would cause the weights and measures official to do an injustice to some merchants who are operating vehicle scales.

Mr. HARRISON. Mr. President, in supplementing Mr. Holbrook's remarks, I would like, if you please, to make my position perfectly clear.

I appear before you at this time as a delegate and representative of the Engineering Division of the Association of American Railroads. That Association, as far as I know, is the largest single user and testing agency for scales of the class which you have been discussing. The Engineering Division of the Association of American Railroads is whole-heartedly in accord with the present specifications and tolerances of the Conference and in the name of that division I ask you not to reverse them at this time.

Mr. KANZER. Mr. Chairman, it is getting quite late in this session and I think we will arrive nowheres; I feel that those who favor one side will not give way to those who are on the other side. It occurs to me then, after hearing the discussion—and I know nothing about the matter at all—that everybody agrees on one matter, namely, on end tests there should be a tolerance of 0.2 percent, or 2 pounds a thousand. When the error is over 2 pounds per thousand on an end test, then the scale is incorrect. On a corner test, however, one side thinks the tolerance should not be greater than 2 pounds per thousand,

Digitized by Google

the other 4 pounds. Why can't we get together and see if we cannot work it out this way:

Resolved that the tolerance on scales should not exceed 2 pounds per thousand; that on vehicle scales the usual corner test of platform scales need not be made; instead in addition to the test up to the capacity of the scale the test vehicle shall be driven centrally on the scale with the rear axle near one end and then near the other end. When the test indicates that the error is in excess of 2 pounds per thousand, there shall be an additional test made on each corner of the scale.

I think by that we have covered both sides of the question. We will have added tests for those who want them for the purposes of repairs.

Mr. ALFREY. I represent the Rock Island Railroad. From my own experience we are having no trouble in keeping scales that are in operation well within the tolerances of 2 pounds per thousand. I believe one of the arguments for increasing those tolerances is the fact that many of the vehicle scales are being badly overloaded; in other words, light wagon scales are being used for motortrucks. In testing track scales in the early days we had somewhat the same condition. Some thought we could not weigh accurately. We are doing it fairly well. One of the difficulties we had was that we had track scales in service which did not rate more than 60 tons on which 100- and 125-ton cars were being weighed, and those scales were included in the reports that are annually made by the National Bureau of Standards.

Now, another thing. The amendment suggested by Mr. Holbrook will help, but let us not overlook the fact that not 1 scale in 25 tested is a new scale or a recently shop-repaired scale. The ordinary scales that you test or that we test are scales that have been in service for some time. Therefore, simply cutting the tolerance in half on a shop-repaired scale is not going to remedy the situation as far as I can see.

Mr. Holbrook mentioned a few minutes ago that scales are not designed so that you can make any adjustment upon any corner. I cannot conceive of any condition that would produce an error of 0.4 percent on a scale. A scale with such an error does not need adjustment, it needs something besides adjustment; it needs taking out. I reiterate that as far as I can see there is no occasion whatever for scales being left in service that ordinarily produce an error of 4 pounds per thousand on any corner. Contrary to the views expressed here, that does cause a considerable weighing error. In Oklahoma, where we weigh wheat in large quantities, there was a scale that was well within the tolerance of 0.2 percent, still the shippers were complaining because one scale would not check with the others closely enough. We do have scales which we can expect to weigh closer than that. The question before the Conference involves the vast agricultural area which is the great user of scales.

Mr. PISCIOTTA. Mr. Chairman, I believe this question is such that it requires a great deal of time and study. I would propose—not for the purpose of limiting the discussion but that we better understand this matter—that that matter be referred to the Tolerance Committee to determine whether or not any changes should be made in the tolerance.

(The motion was seconded.)

Mr. LEVITT. Mr. Chairman, isn't there a motion before the house? I do not know a lot about scales but I would like to have an expression of opinion from the boys who are out in the field engaged in that

Digitized by Google

work; I would be perfectly willing to go along with the majority. I would like to have a vote on it to see where we stand.

The ACTING CHAIRMAN. We have a motion before the house, Mr. Pisciotta; do you offer your motion as an amendment?

Mr. PISCIOTTA. I would make my motion as an amendment, but if Mr. Levitt objects to that and wants action taken at this Conference without further study, I will withdraw it.

Mr. LEVITT. I would still like to have a vote upon the motion, and then in turn Mr. Pisciotta's motion could be taken up.

Mr. PISCIOTTA. Under the circumstances, I withdraw the motion and ask for the question.

The ACTING CHAIRMAN. The question is upon the original motion to amend the tolerance on vehicle scales by reducing the maximum tolerance on corner tests on used scales from 0.40 percent to 0.20 percent, and similarly, on new scales and repaired scales, to reduce the maximum tolerance from 0.20 percent to 0.10 percent.

Mr. HARRISON. Before the question is put, may I have a word?

(The question was called for.)

The ACTING CHAIRMAN. There seems to be objection, Mr. Harrison.

Mr. HARRISON. Very well.

(The question was taken, and the motion was lost.)

Mr. PISCIOTTA. I now resume my motion that the matter be referred to the Committee on Specifications and Tolerances.

(The motion was seconded, the question was taken and the motion was agreed to.)

Mr. HOLBROOK (reading):

SCALES—TOLERANCE TABLES 2, 3, and 4.

Amend the reference appearing in brackets immediately below the main table heading to read as follows:

(See also paragraphs A–2q, B–2w, and B–2x.)

That is purely a formal amendment. The attention of the reader is called to the fact that new paragraph A–2q should be read before the tolerances are applied.

(The amendment as proposed by the Committee was duly adopted.)

Mr. HOLBROOK (reading):

SCALES—TOLERANCES FOR PERSON WEIGHERS.

Amend paragraph J–7 to read as follows:

J–7. FOR PERSON WEIGHERS.—For the tolerances on person weighers see paragraph J–1.

That amendment is to correct an error which occurs in Handbook H22. The tolerances referred to now are the tolerances for small-capacity scales. A person weigher should, of course, take the tolerances for large-capacity scales.

(The amendment as proposed by the Committee was duly adopted.)

SECTION ON LIQUID-MEASURING DEVICES

Mr. HOLBROOK. In the report of the Committee distributed Tuesday it was stated that one or two matters were still under consideration. The amendment we are about to propose was decided upon after the report was distributed. This should be considered with

Digitized by Google

very great care, because you have not had the customary 48 hours to consider it [reading]:

LIQUID-MEASURING DEVICES.

Add a new regulation to read as follows:

5. RATE OF FLOW.—The installation of a wholesale device shall be such that the rate of flow through the device will not exceed the rated capacity of the device; if necessary, effective automatic means for flow regulation shall be installed.

Now, wholesale meters are being installed in various localities. A meter may be on an individual line or it may be installed on one outlet of a complicated system of lines. The meter is usually labeled with the maximum rate of flow which the manufacturer believes should be allowed if the meter is to be properly protected. It has been pointed out to the Committee that in certain installations there may be two or three or more outlets which may be operated simultaneously or individually. There may be a common pump to supply all of those lines. If the pump is operated at full capacity with all the lines open, each meter may not deliver more than the rated capacity; if, however, during the operation the meter or meters on one or two individual lines are cut off while one meter remains in use, then such a pressure may be developed that the flow of gasoline through that meter may be very much in excess of its rated capacity. It is for conditions such as these that this regulation is proposed.

Mr. ENGELHARD. Mr. Chairman, we all believe that is a right-good common-sense practical amendment, but I do not like the wording "if necessary"—it could be "when found necessary." I might think it was necessary, but others might say that it was not necessary.

Mr. HOLBROOK. It might be changed to read "if necessary to accomplish this purpose, effective automatic means for flow regulation shall be installed." With the consent of my Committee, I propose that amendment.

Mr. ENGELHARD. I believe that would be satisfactory.

Mr. GRIFFITH. If the movement of the liquid through the meter exceeded the rated capacity, it would be apparent on the face of it that it is necessary to control it.

(The regulation, as proposed to be amended, was duly adopted.)

Mr. HOLBROOK. That concludes the report.

Mr. ROGERS. Mr. Chairman, I move that the report of the Committee on Specifications and Tolerances be adopted in its entirety, with the amendments as made at this meeting.

Mr. ENGELHARD. Mr. Chairman, I do not think the report has gone far enough. I think the Committee on Specifications and Tolerances has overlooked the necessity for clamping down on the rather liberal tolerances which are now granted upon bulkhead meters. We have had quite a discussion this morning as to whether or not you should cut the tolerances on scales from 0.40 percent to 0.20 percent, and yet in the case of bulkhead meters the tolerance on 50 gallons is 50 cubic inches, which means 0.43 percent, and that is altogether too much. The Committee should study this subject further with a view to reducing that.

Mr. BAUCOM. I might say I could not accept that large a tolerance. As a matter of fact the manufacturers guarantee their meters within

Digitized by Google

0.10 percent, if operated as directed. We have adopted their advertising and their guarantee and put that into our specifications.

The ACTING CHAIRMAN. I want to ask that Vice President C. J. P. Cullen please come forward and take charge of the meeting at this point.

(Thereupon, Mr. C. J. P. Cullen, Vice President, assumed the chair.)

PROMOTING CONTESTS

By B. W. RAGLAND, *Chief, Bureau of Weights and Measures, City of Richmond, Va.*

My experience in weights and measures work has caused me to seek the answer to several very important questions arising in connection with its administration, since it seems to me that we must have these answers before we can hope to have our work assume its rightful place in the scheme of government.

I have often wondered why it was, that the work attempted by weights and measures officials was so little appreciated. I have seen States support, both morally and financially, their other protective bureaus, such as fire, police, drugs, and food, and at the same time neglect the Bureau of Weights and Measures. Yet this bureau is of vital importance and offers protection to the pocketbooks of the housewives, merchants, and manufacturers of our Nation. Why should it remain unnoticed except in rare instances; and why does this apparent neglect seem of such little importance to the consuming public? Is it because so many of our weights and measures officials spend all of their time in technical supervision of weights and measures devices?

How often have I noticed in many State conferences the effort expended in discussion concerning the tolerances and specifications covering fabric-measuring devices, milk bottles, liquid-measuring devices, scales, and every other known device. We seem to be sticklers for these things, and all of us have our particular schemes and lose much valuable time advancing our ideas appertaining to all types of equipment. We require manufacturers making various types of weights and measures devices sold in our jurisdiction, to meet the requirements in the most minute detail, putting them at times to great trouble and expense, and sometimes acting in an arbitrary way. When the manufacturer has perfected the desired device, we usually stop there.

Why is it that you visit so many jursidictions and find merchants selling commodities from tomato cans, wooden measures, bad pumps; find there is no enforcement of law and no support for the official; find that the bureau is unknown to merchants and afraid to do anything in opposition to a politician's wish? When we note this apparent lethargy of so many bureaus, we cannot expect the public to have a very exalted opinion of us or our work. At times I have been ashamed to be known as a weights and measures official.

Knowing these facts to be true, I decided to try and sell weights and measures to the people of Richmond and show them our real worth and value. Realizing that clerks and service-station operators need to know the law and its requirements, I thought of a contest as a means to promote this knowledge.

Digitized by Google

We therefore conducted a contest for the grocery clerks, and went on the air and released to the newspapers of the city, the following:

There was shown, recently, a picture built upon the activities of a certain weights and measures bureau. This picture created much interest, which was reflected in the number of inquiries received by the local weights and measures bureau.

These inquiries and complaints convinced the bureau that many mistakes are made by men in our stores and other places of business, due to the fact that the clerks are not informed as to rules and regulations promulgated by the weights and measures bureau.

Feeling as we do, we are going to sponsor an educational program which will, in a measure, remove this objectional handicap. A contest will be conducted by the bureau, consisting of questions relative to weights and measures work with which the clerks should be familiar. We are going to open this contest to the grocery clerks first, and then will conduct a similar one for the service-station operators and attendants. The League of Housewives will probably sponsor a similar program for the housewife in the city.

The clerk submitting the best paper will receive twenty dollars ($20), the second best, ten dollars ($10), and the third best, seven dollars and fifty cents ($7.50). We would be pleased if all grocery clerks in the city would enter this contest.

A similar contest was conducted along the same lines for the service-station attendants; questions were asked relating to their particular work. Some original and humorous questions were injected to add further public interest. This contest was sponsored by the Brodie, Neptune, and Pittsburgh Meter Companies. A picture of the successful contestants and a résumé of the contest appeared in our daily newspapers. Complimentary articles appeared in the Consumers News, Consumers Guide, Pender's Triangle, The Food Field Report (the official newspaper of the Food and Drug Industry), Meat Merchandising, The Commonwealth, Reader's Digest, Petroleum News, and the Scale Journal (the paper we love and ought to support). A poster was published by the Toledo Scale Co. carrying the story of this contest and its findings. Letters were received from Canada, Brazil, and numerous other foreign countries, from Puerto Rico, and from many States in the Union. I have here on the desk, the magazines noted above, which I will be glad to have you review at your leisure.

The local results were amazing, and far beyond our fondest anticipation. Our office was swamped with complaints, and calls came in from various parts of the city, both from housewives and merchants seeking information. The chief of the bureau received more invitations to speak than he was able to accept. They came from the Richmond First Club, the Housewives League, Sunday school forums, businessmen's organizations, and the like. We appeared before as many of these organizations as possible, stressing each time, the value to our people of the Bureau of Weights and Measures, and the savings resulting from its activities. We endeavored to prove that we were ever watchful of the pocketbook of the housewife. We investigated hundreds of complaints, which were settled in the office. Forty-eight cases were taken to court with the result that we secured 47 convictions, and but one dismissal. Two cases were appealed; in one case the conviction was sustained by the court; a dismissal resulted in the other.

One of the results of increased interest is demonstrated in that our housewives are now requiring wet wash to be weighed at the front door when it is collected, and when it is returned, by the laundry-

Digitized by Google

man; laundrymen are appealing to us to approve scales suitable for this purpose. The value of the campaign is further evidenced by the fact that our city council has amended old laws and enacted new laws without a dissenting vote, the recommendation of the bureau being accepted as sufficient. As a result, all weighmasters in the city have been transferred to this bureau, and all weighing and measuring devices must be approved by the bureau before installation.

We realize that knowledge is power and if we of the weights and measures world are to become a powerful organization, we must put this knowledge of our efforts over not only to merchants but also to the consuming public; we must sell our wares to the judges, politicians, and those in authority, and let them know that the public is behind the bureau so that they will give it the proper support and reinforcement.

Let the public speak! And with this support, there is no limit to the heights that we may attain. We will be in such a position that the powers-that-be will see our strength and be afraid not to give us our rank with the other great protective bureaus. An editorial appeared recently in the Roanoke World-News, Roanoke, Va., which beautifully expresses the thought I wish to leave with you. I quote one paragraph:

"Some time ago the city of Indianapolis appointed an inspector of weights and measures. And instead of being content to draw his salary, this lad took his work seriously. As a result, certain types of merchants are after his scalp, but the housewives of Indianapolis have rallied to his support. It would now be political suicide to interfere with his work."

Gentlemen, in closing, I want to say that we do not in any sense of the word overlook the fact that these technical matters of which I speak are a vital and important part of our work, for we have in our organization highly trained technicians who perform a necessary service. But they are only parts of the machine, and other parts are equally vital if the whole machine is to function efficiently. Only when the whole machine is operating smoothly are we in a position to furnish the public the protection which it has the right to demand. When we fully furnish that service, then we can proceed to sell to the public the value of the bureau. We feel, in our work, that it is essential to follow through; that it is much better not to see a violation if we are not going to take action, as a threat unexecuted is dangerous If you know that you are right, act, be master of the situation, never leave a job incomplete!

Be a necessity to others,
Let no man be a necessity to you.

REPORT OF COMMITTEE ON NOMINATIONS, PRESENTED BY O. E BRENNEMAN, CHAIRMAN, AND ELECTION OF OFFICERS

Mr. Chairman, and members of the Conference: The Nominations Committee is making its report out of regular order at the suggestion of the chairman.

It was the unanimous opinion of your Committee that the number of vice presidents should be increased from four to six, the first four to be selected from State department heads, the remaining two positions to be filled from county or city officials. We, therefore, respectfully submit the following:

Digitized by Google

For President, Dr. Lyman J. Briggs; Vice Presidents, W. S. Bussey, Rollin E. Meek, Charles C. Read, C. E. Tucker, B. W. Ragland, Howard E. Crawford; Secretary, F. S. Holbrook; Treasurer, George F. Austin, Jr.

For members of the Executive Committee, James A. Boyle, Charles H. Bulson, A. J. Jensen, H. N. Davis, S. T. Griffith, C. L. Klocker, James O'Keefe, Frank L. Hammon, C. J. P. Cullen, George M. Roberts, Edward R. Fisher, John P. McBride, Louis G. Waldman, George Warner, W. P. Reed, and William C. Witfoth.

(Signed) O. E. BRENNEMAN, Ohio, *chairman.*
A. J. JENSEN, North Dakota.
WILLIAM FOSTER, Springfield, Mass.
JOHN J. LEVITT, Illinois.
GILBERT S. SMITH, Cape May County, N. J.
B. W. RAGLAND, Richmond, Va.
Committee on Nominations.

(It was moved and seconded that the report be adopted, the question was taken, and the motion was agreed to. Accordingly, the gentlemen nominated by the Committee on Nominations were duly elected to the respective offices.)

DIMENSIONAL METHOD OF TESTING CONTAINERS FOR FRUITS AND VEGETABLES

By L. C. CAREY, *Specialist in Package Standardization, Bureau of Agricultural Economics, United States Department of Agriculture*

The proposal to amend the regulations under the Standard Container Act of 1928 to authorize the use of the dimensional method of testing containers was submitted to the Secretary of Agriculture on December 10, 1935, in the following words:

* * * The purpose of this amendment is to authorize the use of the dimensional method of testing baskets as to their compliance with the Standard Container Act, supplementary to the bulk-for-bulk method now prescribed in the regulations.

This matter has been carefully studied for more than 2 years, and has been discussed in detail with the National Bureau of Standards, Department of Commerce. As a result of this study we are convinced that, as compared with the bulk-for-bulk method and in its application to veneer packages, the dimensional method is of equal or greater accuracy, that it is thoroughly practical, and that its optional use will facilitate the administration and enforcement of the Standard Container Act through simplifying and expediting the examination of samples in the Washington office. Moreover, unlike the bulk-for-bulk method, the dimensional method may be applied in the field or factory, thus affording a greater opportunity for service, and a larger measure of direct regulation.

The act fixes the standard sizes of hampers, round stave baskets and splint baskets, and directs the Secretary of Agriculture to prescribe such tolerances as may be necessary to allow for variations occurring in the course of manufacturing and handling. The proposed special and specific method of applying tolerances to splint baskets seems to be necessary because of the peculiar conditions under which such baskets are manufactured and prepared for commercial use, and because of which neither of the usual methods of capacity determination is satisfactory. The type of handle commonly used almost invariably either constricts or expands the basket, often reducing or increasing the capacity beyond the tolerances established for and generally suited to other types. There is a greater opportunity and hence more tendency for the material in these baskets to warp than in other types of containers; and the common practice of bundling these baskets with one end of one basket inserted in one end of another basket further distorts them. For these reasons, as delivered to the trade, splint baskets seldom reflect the care and precision the manufacturer may have exercised in making them.

Digitized by Google

In order to make proper allowance for these factors, it is proposed to standardize those factors which determine size and over which the manufacturer has control—namely, the basket material which determines the depth and bottom dimensions of the basket, and the forms over which the baskets are made which determine the top dimensions—and to base compliance with the requirements on adherence to such standard form and material specifications. Our investigations indicate that enforcement on this basis would be entirely effective and adequately serve the purposes of the Standard Container Act.

Pursuant thereto, effective January 1, 1936, the regulations under the Standard Container Act of 1928 were amended to read as follows:

Except as hereinafter provided, for the purpose of ascertaining whether a container is within the tolerances established by these regulations, it shall be tested by the bulk-for-bulk test, as described in Miscellaneous Publication No. 75, or by the dimensional method which consists in taking the dimensions of the container and from these computing the capacity.

The exception referred to relates to square-braid splint baskets for which in the regulations standard splint baskets, standard splint basket material, and standard splint basket form specifications are set up together with appropriate dimensional tolerances. Similar specifications for Diamond Weave baskets have been developed and are being tried out preparatory to their incorporation in the regulations.

Subsequently, effective September 1, 1936, the regulations under the act of 1916 were amended to authorize capacity determination by the dimensional method. Under this act we believe Climax baskets could and should be handled as splint baskets are handled under the other act, namely, on the basis of conformity to the specifications set forth in the act, supplemented only by one additional specification, namely, inside vertical depth. No doubt this will eventually happen.

Early and preliminary considerations.—The idea that baskets for fruits and vegetables could and should be tested by the dimensional method is much more than 2 or 3 years old. Of my own personal knowledge, the machine makers and some basket manufacturers have so contended from as far back as 1928, and, as a matter of fact our Bureau has always used it in conjunction with the bulk-for-bulk method to determine the net, effective capacity of hampers constructed with the inside top hoop set down to accommodate the cover. But even that operation required a calculating machine properly to handle the fractional measurements. And right there, I suspect, was one chief reason why no one could get enthusiastic about developing a dimensional method. Fractions on the one hand, and curved, irregular contours on the other, particularly in round stave baskets, were for a long time discouraging obstacles.

I believe it may be said that the wish and desire to apply the dimensional method to baskets became a possibility with the discovery, first, of a suitable method for computing the capacity of a round-bottom basket, and second, a practical method of handling fractional measurements—through the device of cubical equivalents. Credit in both instances goes to Martin Storey, a laboratory assistant who has something of a natural flair for figures and a penchant for finding an easier way or a short cut to an assigned objective.

However, as not one of us was a true scientist, the technique was developed, not in accordance with a well-defined plan of procedure, but largely by the trial and error method pursued over a period of several years, and not altogether from choice. It was developed as

Digitized by Google

a matter of necessity to provide a check against bulk-for-bulk tests, at that time the only basis for judging the adequacy or sufficiency of specifications submitted for approval as required by the Standard Container Act, and which in several instances had proven to be not altogether reliable. Beginning in 1928, hundreds of such specifications had been submitted, and on the basis of rapeseed tests, they had been approved, first tentatively, and then finally when substantiated by at least one subsequent test. The memory of those years will linger for a long time, as manufacturers patiently and cooperatively strove for final approval, or gave up in disgust. During that time, our faith in the fairness and practicability of the bulk-for-bulk test for veneer packages became badly shattered.

First formal proposal—August 1934.—However, it was not until August 25, 1934 that the proposal to adopt the dimensional method was first formally presented to the chief of our Bureau, in substantially the following words:

> Submitted herewith for consideration is a proposition, which, if approved, will involve changes in the regulations under the Standard Container Act. The Solicitor states that such a change is permissible if approved administratively.
>
> Some of the advantages envisioned by the proposed plan are: 1. Universally applicable—in the field as well as in the laboratory; 2, provides manufacturers with a test they can apply themselves and removes an existing alibi; 3, provides a more positive objective for field work from the standpoint of service, education, and cooperation; 4, provides a definite basis for detecting violations on the spot; 5, removes from testing the vagaries incident to warping and other factors more or less beyond the control of manufacturers; 6, encourages the designing of baskets on straight lines; and 7, expedites rendition of reports, and reduces the manual labor now required to prepare and test baskets.
>
> The present bulk-for-bulk method of testing baskets has been employed for 17 years and has served a great purpose. The administration and enforcement of the standard container acts and all that has been accomplished in the standardization and simplification of baskets has been through the application of such tests. Nevertheless, it is generally conceded that the met hod has certain disadvantages.

Disadvantages of the Bulk-for-Bulk Method

Baskets are commonly tested with rapeseed of which a cubic inch contains approximately 3,500 seeds. The cracks and openings in baskets must be closed in some manner so that tests may be made with this medium, and for this purpose gummed-paper tape is used. The openings range in size from mere slits in berry boxes to openings 2 or 3 inches wide and 24 inches long in 1½-bushel hampers. Rightly or wrongly, but inevitably, baskets are rebuilt or built up in our laboratory preparatory for testing, so that in many instances it would be difficult for a manufacturer to recognize his product.

The gummed tape is applied as smoothly and evenly as possible, but certain inequities and inconsistencies in the resultant tests are unavoidable. Where the veneer is warped or sometimes in poorly constructed baskets, the interstices or depressions are of such nature that, reinforced with gummed tape they accommodate a certain volume of rapeseed, whereas normally they would accommodate no portion of the product commonly packed in the basket. In such instances the rapeseed tests show capacities somewhat larger than the actual effective capacity.

On the other hand, when the larger openings are bridged over with tape, the resultant tests may show capacities larger or smaller than the actual effective capacities, depending on whether the tape dries taut or slack. There have been instances where the rapeseed tests, in the light of the inside dimensions of the baskets, could be explained or understood only by reference to the warped condition of the staves or to some other similar capricious phenomenon. In such instances, even though no mechanical adjustment consistent with preponderant manufacturing practice or recognized specifications may be suggested, the manufacturer cannot be given a clear bill. He is simply asked to try again. Thus in the manufacture of standard sizes of certain types of baskets the element of luck or chance is not altogether lacking.

This—to the extent that it obtains—is unfair to the manufacturer and detracts from the dignity and force of administrative and enforcement efforts; and, to the

Digitized by Google

extent that it is recognized by the industry, it has probably contributed to the feeling prevalent in some quarters that there may be something a little incongruous in the idea of testing with rapeseed containers destined as carriers of apples, cabbage, and spinach.

* * * Besides this, there is the additional fact that tests such as are prescribed cannot be made at the factory unless a manufacturer possesses somewhat elaborate equipment. There is considerable merit to the contention that a manufacturer has no way of knowing whether his baskets are of proper size except to send samples to Washington. When he starts operations after a shut-down, or even after minor repairs have been made, he must either submit samples to our laboratory and wait for a report, or proceed to manufacture, "shooting in the dark."

Our work in the field fails of maximum effectiveness for the same reason, namely, because tests must be made with rapeseed. A basket on the market or in a factory may have all the appearances of being undersize—actual measurements of it may definitely indicate that it is an illegal container for fruits and vegetables, yet under the regulations it may not definitely be pronounced so until it has been tested with rapeseed. While such tests are being made the manufacture and sale of the questionable baskets may go on for several days.

Assuming that the field man stays on until a report on the samples is received and that he sees that an adjustment is made in the basket—does he know that the proper adjustment has been made? Not by any means. There must ensue another submission of samples and another period of waiting for a report.

Is there an alternative—a more expeditious and practical method?

Five years of work in connection with the approval of specifications under the Standard Container Act, together with some little research into the practical application of those specifications seems to indicate that there is. And, as opposed to the present method of testing which involves special equipment, the proposed plan requires only simple tools—a straight edge, a rule, a pair of inside calipers, and a pair of dividers. The same detailed measurements that are now taken of all samples, and the present schedule of tolerances are used.

Conference with National Bureau of Standards.—The proposal was immediately recognized by our Bureau as having some merit, but it was not until the following summer (1935) that we were authorized to confer with the National Bureau of Standards. Here the proposition was examined with characteristic care and precision, and reported on under date of July 23, 1935.

It hardly seemed possible that anything could be wrong in so many different ways, but particular exception was taken to the differences in the capacities of individual baskets by the two methods, which in 30 of the 94 bushel baskets considered ranged from 10 to 35 cubic inches. The Bureau said:

> It is considered probable that the differences between results secured from the two methods under consideration are largely to be accounted for by reason of the irregular shapes of the baskets. Such irregularities cannot, it would appear, be evaluated by any practical dimensional method. The differences resulting from this cause are therefore inescapable, and if their magnitude is dangerously great, it follows that the dimensional method is not satisfactory for testing work.

This conclusion was, of course, inevitable, if for veneer containers the bulk-for-bulk test could be assumed to be "a standard method of acknowledged accuracy," as it is for dry measures. Concerning this, we pointed out that as defined in National Bureau of Standards handbook "dry measures and baskets used as dry measures shall be made of metal, well-dried wood, or composition, or similar suitable material, and shall be of sufficient strength and rigidity to withstand ordinary usage without becoming materially warped, bent, dented, distorted, or otherwise damaged."

Round stave baskets and other veneer packages for fruits and vegetables are not in this category. Their characteristics are the very antithesis of the qualities enumerated. One of the prime requisites

Digitized by Google

of fruit and vegetable containers is that they shall be cheap, and they are usually constructed with that thought foremost in mind. They are not made of well-dried wood or similar material. Some part of every basket is green wood, and some baskets are constructed entirely of that material, rotary cut, fresh from cooking vats. Strength and rigidity are largely secondary considerations, and warping and distortion are so generally characteristic as to be noted usually only in their absence.

Since most veneer packages lack in some degree the qualities required of containers to which the bulk-for-bulk method of testing is applicable, it follows that when such packages are tested by that method the accuracy of the results may be seriously questioned. Our investigations seem clearly to show its fallibility in this field, and that it furnishes no consistently accurate, constant, or reliable standard with which to compare the sufficiency of an alternate method.

Among the variable factors which render capacity determination of veneer packages by the bulk-for-bulk method an unreliable index of true capacity are (1) contour of the top, (2) contour of the bottom, and (3) the human equation.

Under 1, contour of the top: Other things being equal a basket with a level top will test approximately the same regardless of the position in which it is struck off. The capacity of a "sway-back" basket, that is, one having two relatively high sides opposite two relatively low sides, will vary with the position in which the basket is struck off. In one instance, a basket struck off from low side to low side tested 1 bushel minus 23 cubic inches; struck off from high side to high side, the capacity was 1 bushel minus 2 cubic inches, a difference of 21 cubic inches. Quartering positions gave different results.

Under 2, contour of the bottom: In one instance a basket with characteristic warped bottom was sealed by bridging the openings, and again by following the openings. The difference in capacity was 9 cubic inches.

The human equation was shown to contribute as much as 7 cubic inches to the fallibility of the bulk-for-bulk test.

Assuming then, that the capacity of a round stave basket is relatively constant, it appears that by the bulk-for-bulk method of testing the capacity may vary with the position in which the basket is tested (21 cu in.) with the manner in which it is sealed (9 cu in.) and with the individual making the test (7 cu in.). These factors might combine to give a cumulative variation of 37 cubic inches. From this it seems clear that the capacity of a round stave basket as determined by the bulk-for-bulk test cannot be presumed to be conclusive; that at best it can be considered only a close approximation; and since several results are possible several questions arise: Should baskets be subjected to more than one bulk-for-bulk test, and if so, how many, and which result could and should be considered official?

Actual change in size.—But investigations disclose that the capacity of a round stave basket is not constant, being subject to wide changes due to shrinkage and related factors. One lot was observed for 34 days. In that time the capacity changed 55 cubic inches by computation and 63 cubic inches by bulk-for-bulk test. Another lot in 25 days changed 44 cubic inches by computation and 45 cubic inches by volumetric test. And this seems further to indicate that the capacity

Digitized by Google

of a round stave basket as determined by either method is at best only a close approximation, depending upon, in addition to the factors above referred to, the age of the basket and perhaps also the conditions under which it has been preserved.

Dimensional method not infallible.—But neither method is fool- nor factorproof. The data which seem so clearly to show the volumetric method to be less than perfect disclose somewhat similar weaknesses in the dimensional method. That the capacity of individual baskets as determined by this method by different operators is likely to vary in appreciable amounts cannot be denied. But it seems significant that any results by that method are likely to agree very closely with some one of the several possible results by the volumetric method.

The suitability of the dimensional method for testing veneer packages may well be predicated on that point. Throughout the investigations, and in our routine service work in the field since adopting the new method, the net findings, that is, whether the containers are within or outside of the established tolerances, have been practically, if not 100 percent, identical. Thus far we are convinced of the practicability of the dimensional method; that the administration and enforcement of the standard container acts have been made much more effective, and the opportunity for service widely expanded. There has been no adverse criticism, but rather only commendation from those with whom we work and try to live.

I want to close this over-long discussion by saying that the use of the dimensional method in no way alters or affects the procedure in cases in which prosecution is contemplated. It has never been considered safe to predicate a prosecution on the test of a single sample or a single lot of samples. In questionable cases the containers are subjected to tests by both methods and the findings of each used to substantiate the other. The advantage of being able to do this was demonstrated in the only case in which any substantial defense was offered. The court asked if the findings by the volumetric method could be substantiated by any other method. Our witness replied that to his satisfaction he could do so by the method we have been discussing. The court was satisfied.

Concerning the application of the method and the administration of the standard container acts, all of the interesting details cannot be touched upon in a discussion of this kind. Some of the suggestions made by Mr. Smith and Mr. Holbrook relative to the application of tolerances have not as yet been acted upon, but they have not been lost sight of, and will receive attention in due time. I have said that neither the bulk-for-bulk nor the dimensional method is foolproof, and we are still very much engrossed in perfecting and standardizing the technique of measuring baskets as a means of minimizing error due to the human equation. We are also developing and promulgating standard specifications as a means of simplifying manufacturing practices, whereby the administration and enforcement of container legislation are, themselves, automatically simplified.

I might say, Mr. Chairman, that we have prepared a mimeographed circular which we have called "The Dimensional Method of Testing Containers for Fruits and Vegetables as to the Compliance with the Requirements of the Standard Container Acts." Copies of this mimeographed circular are available here and anyone that desires a copy may have it.

Digitized by Google

CALIFORNIA GASOLINE AND OIL SUBSTITUTION ACT

By C. E. TUCKER, *Chief, Division of Weights and Measures, State of California*

Mr. President, delegates, and visitors: It is with a sense of gratitude and deep appreciation that I accept the privilege of addressing you on the California Gasoline and Oil Substitution Act, and I will thank you to bear with me, for I fully realize my limitations in doing justice to this very important subject. I cannot, of course, deal with it from a professional or even a theoretical standpoint for want of personal special application. I must, therefore, deal with it from experience, regarding it as a practical unit of service in the great constructive work in which we are engaged.

The inspection of petroleum products is by no means new legislation. It is nearly as old as the industry itself. As a matter of fact, inspection laws are about the earliest form of State regulation. No doubt you recall when gasoline was considered a bothersome by-product and when crude oil from which the gasoline content had been removed was worth a premium price. The passing of laws requiring the inspection of kerosene became necessary. The inspection, as records show, was a simple flash test. The purpose of this inspection was to prevent the sale of and to protect the purchaser from a commodity for lighting purposes having too low a flash point to be safe.

As far back as 1862, Zachariah Allen, a chemist of Providence, R. I., reported on experiments undertaken at the instance of the Rhode Island Fire Insurance Co. From physical tests it was determined that the temperature of oil in lamps varied between 71° and 79° F. It was very conclusive from these tests that a safe illuminating oil from petroleum was possible, provided it did not contain any of the more volatile fractions.

The Nation-wide awakening to the realization of the importance and practical use of illuminating oil brought about a Federal law in 1867 forbidding the adulteration of illuminating oil with naphtha and specified a fire test (open cup—old type) of 110° F. As is generally the case, with the passing of years and change of trade conditions, the advocation of new regulations or specifications caused controversies, and the law was declared unconstitutional because it usurped the police powers of the State. Following this, many of the States enacted oil-inspection laws providing inspectors' tests and standards for kerosene.

In 1880, 21 of the 38 States had oil inspection. It has been said many of the laws went to the extreme, and in some instances required a flash point of almost twice that of kerosene which was being burned in Europe without danger.

With the advent of the automobile, gasoline became the principal and more valuable product, and the only purpose which there could be for kerosene inspection was to prevent inadvertent mixture. Oil departments then broadened the inspection laws to include gasoline, but as this could not be justified upon a basis of safety, and there was no other basis, the inspection of gasoline for quite a number of years became a farce.

In 1925, California adopted its first oil regulation dealing with lubricating oil. In 1929, California approved through its legislature the first Gasoline and Oil Substitution Act, setting forth standards of quality and provisions dealing with branding and labeling of gasoline

Digitized by Google

and oil. The enforcement and general supervision of the act was placed under the jurisdiction of the State Department of Agriculture, Division of Weights and Measures. Mixing and adulteration were prohibited and sealing authority was delegated to enforcement officers when tests disclosed violations of quality standards. However, because of weakness in the law, officials were hampered in enforcing it. Particularly was this true in the rebranding of gasoline. Furthermore, State agents had no specific inspection authority in the matter of rebrands.

In 1933, an abortive attempt was made to fix the responsibility for inferior products that had been rebranded by requiring the manufacturer's name to be on the pump. The amendment was never accepted as enforceable, and in 1937 it was left out of the new legislation, known as the Wagy Bill, of that year, and based upon experience this bill was accepted as being more workable and effective by all who were concerned with it. The new bill is what we might call a substitution and antifraud act and a fair-trade act combined. Its principal fair-trade features are its requirements that names of brands must be displayed, that reclaimed motor oil and "no brand" gasoline or motor oil must be identified as such, and that actual selling prices must be posted by means of signs of a certain character, deceptive and misleading advertising signs being outlawed. The new measure thus removes unsightly chiseling gasoline signs throughout the State; the price indicated on the signs must be limited to twice the size of the name of the gasoline advertised.

The California Gasoline and Oil Substitution Act stipulates what motor fuel must be in order to be sold as gasoline. This specification, while technical, contains requirements guaranteeing to the public that the physical properties contained therein are such as to assure an efficient and reliable motor fuel to be used in the propulsion of an automobile. This not only prevents unfair competition but is a safety measure. The rebranding of both gasoline and motor oil is effectively regulated, and the requirements are not considered too severe for any person to observe. A dealer, or distributor, is prohibited from selling a rebranded product without written authorization of the original refiner or manufacturer. The authorization must be attached to each invoice and be constantly open for inspection by duly authorized persons. When products are changed from one brand to another, the tank or other container must first be emptied and no other product placed in the container until the tank or pump has been labeled with the brand of the new product in such a way as to comply with the provisions of the law.

It is believed that the new law aims a death blow at inferior motor oils palmed off on the car owners as satisfactory lubricants at cheap prices. In not a few instances such oils have been found to be crankcase drainings, although California has for many years carried laws on its statute books intended to forestall such practices. Under the provisions of the act no reclaimed crankcase drainings or used oil of any kind may be sold unless each container is plainly marked "Reclaimed Motor Oil" or "Reclaimed Lubricating Oil." Any misrepresentation as to the quality of the oil or the identity of the refiner and/or the manufacturer is punishable by heavy fines.

The act provides that in the case of every tank truck, tank trailer, tank wagon, or semitrailer having separate outlets for each individual

Digitized by Google

compartment, there shall be a metal tag, plate, or label for each outlet faucet or valve, on which shall be displayed in letters not less than ½-inch in height the name of the particular product in that particular compartment; on this same tag, plate, or label there must also appear in letters not less than ½-inch in height the brand, trade name, or trade-mark of such product or the words "No Brand."

The California Gasoline and Oil Substitution Act is a self-supporting function. Its revenue is obtained by a license figured at $1 per pump for each and every pump used to dispense, at retail, any motor fuel for use in an internal combustion engine. Motor fuel means any product, namely, gasoline, distillate, diesel fuel, butane, etc., which may be used as a fuel in an internal combustion engine. Service stations and garages selling to automotive equipment, air fields selling to aircraft, and marine stations selling to watercraft are included. The license covers the fiscal year July 1 to June 30.

The Division of Weights and Measures has 13 gasoline and oil inspectors working out of branch offices located in Sacramento, San Francisco, Los Angeles, and Fresno. Each branch office is under the jurisdiction of a State inspector. We also employ two graduate chemists, who with our regular inspectors are under the direct jurisdiction of a general supervisor at Sacramento. These men have been well schooled and are familiar with the arts and sciences of petroleum products. All selections are made from a civil service list.

In addition to the State Division of Weights and Measures, the Los Angeles and San Diego County sealers, Messrs. Fuller and Bruschi, sponsor gasoline and oil laboratories in charge of graduate chemists who cooperate with the State division.

In conclusion I may say that we have here copies of a résumé in which we have made our own interpretation as to each provision of the California Gasoline and Oil Substitution Act, which is chapter 547, Statutes of 1937. We will be glad to have you help yourselves to these.

REPORT OF COMMITTEE ON RESOLUTIONS, PRESENTED BY C. L. KLOCKER, CHAIRMAN, AND ADOPTION OF RESOLUTIONS

APPRECIATION TO DIRECTOR AND STAFF OF THE NATIONAL BUREAU OF STANDARDS

Whereas Dr. Lyman J. Briggs, F. S. Holbrook, R. W. Smith, and their able and efficient staff have extended valuable assistance and guidance to this Conference, of which the Conference is highly appreciative: Therefore be it

Resolved, That this, the Twenty-eighth National Conference on Weights and Measures, does hereby record its grateful appreciation to the above-named gentlemen.

APPRECIATION TO MANAGEMENT OF HEADQUARTERS HOTEL

Whereas the management of the Hotel Washington has done everything within its power to make our present meeting the success which it has been: Therefore be it

Resolved, That this, the Twenty-eighth National Conference on Weights and Measures assembled at the Hotel Washington in Washington, D. C., this 3d day of June, 1938, does express its warmest appreciation and thanks to the management of the said hotel for the careful provisions made for our meeting; and be it further

Resolved, That the secretary of the Conference be instructed to transmit a copy of this resolution to the management of the Hotel Washington.

Digitized by Google

IN MEMORY OF DECEASED MEMBERS

Whereas during the past year we have lost through the plan of Divine Providence several members of this Conference; and

Whereas our association with these departed members has been an inspiration to us to continue with greater determination toward the ideals set by them; Therefore be it

Resolved, That we, of the Twenty-eighth National Conference on Weights and Measures, hereby record this expression of sincere sorrow at the loss of these members.

APPRECIATION TO THE PRESS AND TO THE SCALE JOURNAL

Whereas the press of the city of Washington has been generous in reporting the activities of our present meeting; and

Whereas the Scale Journal has been likewise generous in giving advance notices of our present meeting; Therefore be it

Resolved, That this, the Twenty-eighth National Conference on Weights and Measures, does hereby record its appreciation to the press of Washington and to the Scale Journal.

APPRECIATION OF COOPERATION

Whereas the Chevrolet Division of General Motors has been generous in the displaying of their moving picture covering the activities and growth of the Chevrolet motor car; Therefore be it

Resolved, That the Twenty-eighth National Conference on Weights and Measures hereby records this expression of sincere thanks and appreciation for their cooperation.

ENDORSEMENT OF PROPOSED BILL TO FIX THE STANDARDS OF WEIGHTS AND MEASURES OF THE UNITED STATES

Whereas our President, Dr. Lyman J. Briggs, has called to our attention a proposal to fix the standards of weights and measures of the United States; and

Whereas this Conference is of the opinion that the proposed bill should be adopted and passed by this Congress; Therefore be it

Resolved, That this, the Twenty-eighth National Conference on Weights and Measures, does hereby fully endorse the proposed bill as reported to the Conference by Dr. Briggs, and does urge its passage; and be it further

Resolved, That copies of this resolution be transmitted by our Secretary to the appropriate committees of Congress.

APPRECIATION TO OFFICIALS COOPERATING

Whereas the Governors and the county and city officials of the various States, through their manifest interest in weights and measures work, have made it possible for their respective jurisdictions to be represented at this, the Twenty-eighth National Conference on Weights and Measures; and

Whereas such cooperation and attendance have in a most practical way furthered uniformity in regulations for the various jurisdictions and have otherwise assisted the general good of the work; Therefore be it

Resolved, That this, the Twenty-eighth National Conference on Weights and Measures, does appreciate such practical cooperation and does make this resolution a part of the record of its meeting.

ENDORSEMENT OF PROPOSED FEDERAL LEGISLATION FOR STANDARDIZATION OF PACKAGES FOR CANNED FOODSTUFFS (H. R. 6964)

Whereas our attention has been formally called to certain needed legislation with reference to the standardization of packages for canned foodstuffs; and

Whereas Hon. Harry Sauthoff, Member of Congress from Wisconsin, has introduced in the Congress a bill, known as H. R. 6964, which is intended to accomplish the necessary control of this matter in a manner consistent with the beliefs of this Conference; Therefore be it

Resolved, That this, the Twenty-eighth National Conference on Weights and Measures, does hereby record its hearty endorsement of the bill known as H. R. 6964; and be it further

Resolved, That a copy of this resolution be transmitted by our Secretary to both the Committee on Coinage, Weights, and Measures, and the Hon. Harry Sauthoff.

Digitized by Google

ENDORSEMENT OF PRINCIPLE OF GENERAL STANDARDIZATION OF PACKAGED GOODS

Whereas we have knowledge of the benefit which would accrue from a standardization of all packaged goods; Therefore be it

Resolved, That this, the Twenty-eighth National Conference on Weights and Measures, does hereby record its sincere belief that a general standardization of packaged goods is greatly to be desired, and does direct its Executive Committee to consider ways and means of accomplishing this.

(Signed) C. L. KLOCKER, Connecticut, *chairman*,
MANON L. FOWLER, Highland Park, Mich.,
GARDNER K. HEATH, Maine,
BARNETT KANZER, New York,
ERWIN J. ROGERS, West Allis, Wis.,
HOWARD C. PATTON, Pittsburgh, Pa.,
C. E. TUCKER, California,
Committee on Resolutions.

Mr. GRIFFITH. I move the adoption of the report of the Committee on Resolutions and in doing so I wish to add a word in connection with the last resolution. Mr. W. S. Frisbie, of the Food and Drug Administration of the Department of Agriculture, who is interested in the proposed Food and Drug Act informed me this morning that the bill has finally passed the House; having already passed the Senate, it is now in the hands of a conference committee, to ratify the measures that we are endeavoring to enforce on package goods. I am quite sure you are all glad to hear that information.

The ACTING CHAIRMAN. We do appreciate the information you have given us, Captain Griffith. It will be a great help to each of our States to have the cooperation of the National Government, and now we will be able to get somewhere.

(The report as presented by the Committee was duly adopted.)

REPORT OF THE TREASURER, GEORGE F. AUSTIN, JR.

Receipts:		
Balance on hand June 1, 1937		$510.33
June 2, 1937. Dues, 1937 Conference		194.00
June 2, 1937. Accrued Interest		7.38
Total receipts		$711.71
Disbursements:		
June 2, 1937. Receipt book	$2.00	
June 16, 1937. Bus service in connection with trip to Annapolis, 1937 Conference	179.40	
June 16, 1937. Telephone service	.90	
June 16, 1937. Clerical, mimeographing, and messenger service	30.00	
Total disbursements		212.30
Balance on hand June 1, 1938		$499.41

(Signed) GEO. F. AUSTIN, JR., *Treasurer.*

(The report as presented by the Treasurer was duly accepted.)

Mr. HOLBROOK. Mr. Chairman, I make a motion that the usual expenses of the Conference be authorized to be paid as heretofore.

(The motion was seconded, the question taken, and the motion was agreed to.)

The ACTING CHAIRMAN. We now have unfinished business.

Mr. CRAWFORD. Mr. Chairman, the scalemen have an insignia which they wear on their coat lapels. It is an idea of mine that many of you will agree that we should have an insignia of a similar

Digitized by Google

nature, and I believe it would be one more move in the cause of weights and measures. I would like to make a motion that we have an insignia designed and that it be made available to the members of the Conference at cost.

Mr. HOLBROOK. Mr. Crawford, would you not prefer to have a greater number of the members present, to consider that? Would it not be a good idea to bring that up on the floor next year?

Mr. CRAWFORD. That will be perfectly satisfactory to me.

The ACTING CHAIRMAN. Is there any further business? If not, a motion to adjourn is in order.

(A motion was made and seconded that the Conference adjourn, the question was taken, and the motion was agreed to.)

(Thereupon, at 1:56 p. m., the Twenty-eighth National Conference on Weights and Measures adjourned sine die.)

Digitized by Google

Digitized by Google

Digitized by Google

COLLEGE OF ARMS
APR 24
LIBRARY

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google