U. S. DEPARTMENT OF COMMERCE
HARRY L. HOPKINS, Secretary
NATIONAL BUREAU OF STANDARDS
LYMAN J. BRIGGS, Director

FUEL OILS

(FIFTH EDITION)

COMMERCIAL STANDARD CS12–40

Supersedes CS12–38

Effective Date for New Production, January 5, 1940

A RECORDED STANDARD OF THE INDUSTRY

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PROMULGATION

of

COMMERCIAL STANDARD CS12–40

for

FUEL OILS

(Fifth Edition)

On January 9, 1929, a joint conference of representative refiners, distributors, and consumers of fuel oil, manufacturers of oil burners, and general interests adopted a recommended standard for domestic and industrial fuel oils, which was accepted in writing by the trade and published as Commercial Standard CS12–29. In 1933, 1934, and 1938, upon recommendation of the standing committee to keep the standard abreast of progress, revisions were adopted and issued as CS12–33, CS12–35, and CS12–38, respectively.

On September 30, 1939, with the endorsement of the standing committee, a revision of CS12–38, drafted by Technical Committee E of American Society for Testing Materials Committee D–2, was circulated for acceptance. Those concerned have since accepted and approved for promulgation by the United States Department of Commerce, through the National Bureau of Standards, the revised standard as shown herein.

The standard became effective for new production on January 5, 1940, subject to the expiration of the then-existing contracts.

Promulgation recommended.

I. J. Fairchild,
Chief, Division of Trade Standards.

Promulgated.

Lyman J. Briggs,
Director, National Bureau of Standards.

Promulgation approved.

Harry L. Hopkins,
Secretary of Commerce.

FUEL OILS

(Fifth Edition)

COMMERCIAL STANDARD CS12–40

SCOPE

1. These specifications cover five grades of fuel oil for various types of fuel-oil burning equipment.

GENERAL REQUIREMENTS

2. The fuel oils herein specified shall be hydrocarbon oils free from acid, grit, and fibrous or other foreign matter likely to clog or injure the burner or valves. If required, the oil shall be strained by being drawn through filters or wire gauze of 16 meshes to the inch. (U. S. Standard Sieve 16, ASTM designation 1,190 micron.) The clearance area through the strainers shall be at least twice the area of the suction pipe, and the strainers shall be in duplicate.

DETAIL REQUIREMENTS [1]

3. The various grades of fuel oil shall conform to the detailed requirements shown in table 1. It is the intent of these classifications that failure to meet any requirement of a given grade does not automatically place an oil in the next lower grade unless in fact it meets all requirements of the lower grade.

METHODS OF TEST

4. The requirements enumerated in these specifications shall be determined in accordance with the following methods of testing of the American Society for Testing Materials, except as may be required under paragraph 5.

FLASH POINT

5. *Minimum.*—The flash point, instrument, and method for determining minimum flash point shall be those legally required for the locality in which the oil is sold. In absence of legal requirements, the minimum flash point shall be determined in accordance with the standard method of test for flash point by means of the Pensky-Martens closed tester, ASTM Designation: D 93–36.

6. *Maximum.*—Standard method of test for flash point by means of the Pensky-Martens closed tester, ASTM Designation: D 93–36.

POUR POINT

7. Standard method of test for cloud and pour points, ASTM Designation: D 97–39.

[1] The technical requirements of this revision are identical in substance with ASTM Tentative Specifications for Fuel Oils D 396–39T.

TABLE 1.—*Detailed requirements for fuel oils* [a]

Number	Description of fuel oil	Grade [b]	Flash point (° F)		Pour point (° F)	Water and sediment (percent)	Carbon residue (percent)	Ash (percent)	Distillation temperatures (° F)				Viscosity seconds			
									10-percent point	90-percent point		End point	Saybolt universal (at 100° F)		Saybolt furol (at 122° F)	
			Min	Max	Max	Max	Max	Max	Max	Max	Min	Max	Max	Min	Max	Min
1	Distillate oil for use in burners requiring a volatile fuel.		100 or legal	165	0	Trace	0.05 on 10% residuum [d]		410			[e] 560				
2	Distillate oil for use in burners requiring a moderately volatile fuel.		110 or legal	190	[c] 10	0.05	.25 on 10% residuum [f]		440	600						
3	Distillate oil for use in burners requiring a low-viscosity fuel.		110 or legal	230	[c] 20	.10	.15 straight			675	[g] 600		45			
5	Oil for use in burners requiring a medium viscosity fuel.		130 or legal			1.00		0.10						50	40	
6	Oil for use in burners equipped with preheaters, permitting a high viscosity fuel.		150			[h] 2.00									300	45

[a] Recognizing the necessity for low-sulfur fuel oils used in connection with heat treatment, nonferrous metal, glass and ceramic furnaces, and other special uses, a sulfur requirement may be specified in accordance with the following table:

Grade of fuel oil *Number*	Sulfur (maximum) *Percent*
1	0.5
2	.5
3	.75
5	No limit
6	No limit

Other sulfur limits may be specified only by mutual agreement between the buyer and seller.

[b] It is the intent of these classifications that failure to meet any requirement of a given grade does not automatically place an oil in the next lower grade unless in fact it meets all requirements of the lower grade.

[c] Lower or higher pour points may be specified whenever required by conditions of storage or use. However, these specifications shall not require a pour point lower than 0° F under any conditions.

[d] For use in other than sleeve-type blue-flame burners, carbon residue on 10-percent residuum may be increased to a maximum of 0.12 percent. This limit may be specified by mutual agreement between the buyer and seller.

[e] The maximum end point may be increased to 590° F when used in burners other than sleeve-type blue-flame burners.

[f] To meet certain burner requirements, the carbon-residue limit may be reduced to 0.15 percent on 10-percent residuum.

[g] The minimum distillation temperature of 600° F for 90 percent may be waived if API gravity is 26 or lower.

[h] Water by distillation, plus sediment by extraction. Sum, maximum 2.0 percent. The maximum sediment by extraction shall not exceed 0.50 percent. A deduction in quantity shall be made for all water and sediment in excess of 1.0 percent.

WATER AND SEDIMENT

8. *Water and sediment.*—(For grades 1 to 5, inclusive.) Standard method of test for water and sediment in petroleum products by means of centrifuge, ASTM Designation: D 96–35.

9. *Water by distillation.*—(For grade 6.) Standard method of test for water in petroleum products and other bituminous materials, ASTM Designation: D 95–30.

10. *Sediment by extraction.*—(For grade 6.) Sediment in fuel oil by extraction, ASTM Designation: D 473–38T.

CARBON RESIDUE

11. Standard method of test for carbon residue of petroleum products (Conradson carbon residue), ASTM Designation: D 189–39.

12. *Method for 10-percent residuum.*—ASTM Designation D 189–39.

ASH

13. Tentative method of test for ash content of petroleum oils, ASTM Designation: D 482–38T.

DISTILLATION

14. Distillation of grade 1 oil shall be made in accordance with the standard method of test for distillation of gasoline, naphtha, kerosene, and similar petroleum products, ASTM Designation: D 86–38; and of grades 2 and 3 in accordance with the standard method of test for distillation of gas oil and similar distillate fuel oils, ASTM Designation: D 158–38.

VISCOSITY

15. Standard methods of test for viscosity by means of Saybolt viscosimeter, ASTM Designation: D 88–38.

REFERENCES

16. Complete information regarding the procedure for making the tests specified, but not included in the above text, is to be found in the publications of the American Society for Testing Materials, 260 South Broad Street, Philadelphia, Pa.

SIGNIFICANCE OF TESTS PRESCRIBED [2]

FLASH POINT

17. The flash point of a product may be defined as the temperature to which it must be heated in order to give off sufficient vapor to form an inflammable mixture with air. This temperature varies with the apparatus and procedure employed and consequently both must be specified when the flash point of an oil is stated.

18. The minimum flash point of oils used for fuel is usually controlled by law. When there are no legal requirements, the minimum

[2] For a more comprehensive description of the significance of tests on petroleum products see The Significance of Tests of Petroleum Products, latest revised edition, published by the American Society for Testing Materials.

values in the table are to be employed. Maximum values are specified for oils 1, 2, and 3 to insure the required ease of ignition.

POUR POINT

19. The pour point of an oil is the lowest temperature at which it will flow when cooled and tested under prescribed conditions. Pour-point specifications are included in order that oil may be secured which will not cause difficulty in handling or in use at the lowest temperatures to which it may normally be subjected.

WATER AND SEDIMENT

20. Water and sediment are impurities which are almost entirely excluded in fuel oils 1, 2, and 3, and which are permitted in somewhat larger quantities in fuel oils 5 and 6. It is difficult to eliminate them entirely from this latter group of oils, and the advantage is not sufficient to justify the cost. Water and sediment are determined together by the centrifuge, except for grade 6.

CARBON RESIDUE

21. The carbon-residue test when considered in connection with other tests and the use for which the oil is intended furnishes pertinent information and throws some light on the relative carbon-forming qualities of an oil. For medium viscosity and blended oils it is also used to detect the presence of heavy residual products.

ASH

22. The ash test is used to determine the amount of noncombustible impurities in the oil. These impurities come principally from the natural salts present in the crude oil, or from the chemicals that may be used in refinery operations, although they may also come from scale and dirt picked up from containers and pipes. Some ash-producing impurities in fuel oils cause rapid deterioration of refractory materials in the combustion chamber, particularly at high temperatures; some are abrasive and destructive to pumps, valves, control equipment, and other burner parts. Ash specifications are included in order to minimize these operating difficulties as far as practicable.

DISTILLATION

23. Laboratory distillation of a sample under prescribed conditions gives an index of the volatility of the oil. The 10- and 90-percent points, represent, respectively, the temperatures at which 10 and 90 percent of the sample are distilled. The end point is the maximum temperature recorded by the distillation thermometer at the end of the distillation.

24. The 10-percent point serves as an index of the ease of ignition of the oil; the 90-percent point and the end point are specified to make sure that the oil will volatilize and burn completely and produce a minimum amount of carbon.

VISCOSITY

25. The viscosity of an oil is the measure of its resistance to flow. Maximum limits are placed on this property because of its effect upon the rate at which oil will flow through pipe lines and upon the degree of atomization that may be secured in any given equipment.

26. Viscosity is measured as the time in seconds required for a definite volume of oil to pass through a small tube of specified dimensions at a definite temperature. Viscosity decreases rapidly as temperatures increases, and preheating makes possible the use of oils of relatively high viscosity at normal temperatures. The Saybolt universal viscosimeter is used for fuel oils of fairly low viscosity and the Saybolt furol viscosimeter for more viscous oils.

CERTIFICATION

27. In order that purchasers of fuel oil may become familiar with the significance of grading of fuel oils and purchase fuels for the various types of burners with confidence, it is recommended that the following statement be used on invoices, contracts, sales literature, etc.:

> The ---------- Co. certifies this fuel oil to meet all requirements for grade ------ as specified in Commercial Standard CS12–40, issued by the National Bureau of Standards of the United States Department of Commerce.

EFFECTIVE DATE

The standard became effective for new production on January 5, 1940, subject to the expiration of existing contracts.

STANDING COMMITTEE

The standing committee now consists of representatives of refiners, fuel-oil distributors, burner manufacturers, and consumer organizations. The membership includes a number of members of Technical Committee E of American Society for Testing Materials Committee D–2. The function of this committee is to review, prior to circulation for acceptance, revisions proposed to keep the standard abreast of progress. Comment concerning the standard and suggestions for revision may be addressed to the Division of Trade Standards, National Bureau of Standards, which acts as secretary for the standing committee.

Producers and Distributors:

R. T. Goodwin (chairman), Shell Union Oil Corporation, 50 West 50th Street, New York, N. Y.

R. M. Bartlett, Gulf Oil Corporation, Gulf Building, Pittsburgh, Pa.

K. E. DeRosay, Sun Oil Co., 1608 Walnut Street, Philadelphia, Pa.

S. H. Hulse, Standard Oil Development Co., P. O. Box 246, Elizabeth, N. J.

J. B. Terry, Standard Oil Co. of California, Standard Oil Building, San Francisco, Calif.

Burner Manufacturers:

W. A. Matheson, Delco Frigidaire Conditioning Division, General Motors Corporation, 224 West 57th Street, New York, N. Y.

M. A. Powers, Timken Silent Automatic Division, Timken Detroit Axle Co., 100–400 Clark Avenue, Detroit, Mich.
T. B. Stillman, Babcock & Wilcox Co., 85 Liberty Street, New York, N. Y.

Fuel-Oil Distributors:
F. E. Spencer, Spencer Petroleum Co., 616 South Michigan Avenue, Chicago, Ill. Representing Burning Oil Distributors Association.
Ernest Studerus, Studerus Oil Co., Kearny, N. J. Representing Fuel Oil Distributors Association of New Jersey.
Carl Shields, Petroleum Heat and Power Co., 511 Fifth Avenue, New York, N. Y.
W. H. Butler, Home Fuel Oil Co., People's Bank and Trust Co. Building, Passaic, N. J.

Users:
M. W. Merrill, United States Metals Refining Co., Carteret, N. J. Representing National Association of Purchasing Agents.
Mrs. Carl Weber Illig, Jr., 7 Union Street, Onset, Mass. Representing National Council of Women.

Consumer Safety:
J. H. Witte, Underwriters' Laboratories, Inc., 207 East Ohio Street, Chicago, Ill.

Secretary:
F. W. Reynolds, Division of Trade Standards, National Bureau of Standards, Washington, D. C.

HISTORY OF PROJECT

General conference.—The manufacturers of oil burners and many petroleum refiners had long felt the need of uniform specifications for fuel oils. The American Oil Burner Association assumed the initiative in this matter and developed specifications for six grades of fuel oils with the cooperation of the American Society for Testing Materials and the American Petroleum Institute.

In order to bring these specifications into broader use the cooperation of the National Bureau of Standards was requested. Anticipating the benefits to be derived from a commonly understood basis of quality, all interests of the industry freely participated in a well-attended general conference held in New York City, January 9, 1929, and upon recommendation of this conference the standard was accepted as an everyday guide for the production, sale, and use of fuel oils. The standard was published as Domestic and Industrial Fuel Oils, Commercial Standard CS12–29, effective July 15, 1929, and was reaffirmed on December 10, 1930, and again on December 29, 1931.

First revision.—On June 21, 1932, a meeting of the standing committee, which had been broadening to coincide exactly with section 1 of Technical Committee C of American Society for Testing Materials Committee D–2, representing the producers, distributors, users of fuel oils, and general interests, was held to discuss the need for revising the commercial standard. The committee approved a revision which was formally submitted to letter ballot. The revision embodied a number of minor changes to bring it in line with current practice in the industry, and included a table showing the permissible sulfur content for each grade when the oils are to be used for special purposes.

The revised standard was endorsed by practically all of the larger refiners, by many oil distributors and consumers, as well as the manufacturers of oil burners. It was published as Fuel Oils (second edition), Commercial Standard CS12–33 and became effective May 1, 1933.

Second revision.—As a result of improvements in oil burners and a need for limitations which would eliminate as far as practicable overlapping of oil grades, the standing committee on June 25, 1934, approved for submission to letter ballot a revised draft which set maximum as well as minimum limits for certain characteristics, inserted requirements for carbon residue and ash, and increased the viscosity for grades 3 and 4. Following acceptance by a satisfactory majority, the success of the revision was announced on December 14, 1934, and the standard became effective 60 days later as CS12–35.

Third revision.—A general demand by the industry for a reduction of the number of grades to be stocked by refiners and distributors led the standing committee to recommend the adoption of a revision, drafted by Technical Committee E of American Society for Testing Materials Committee D–2, which reduced the number of grades to five by the elimination of grade 4. Accompanying adjustments were made in the characteristics of the remaining grades, principally in the direction of greater volatility and fluidity. This recommended revision was circulated to the industry for acceptance on February 25, 1938, and the establishment of the revision was announced on May 31, 1938, becoming effective with the announcement.

Fourth revision.—On June 27, 1939, a meeting of Technical Committee E of ASTM Committee D–2 proposed a revision of the standard which it subsequently adopted. This revision was submitted to the standing committee on September 2, 1939, and upon recommendation of the majority it was submitted to the industry for written acceptance on September 30, 1939. Upon acceptance by a satisfactory majority of the industry the establishment of the revision was announced.

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ACCEPTANCE OF COMMERCIAL STANDARD

This sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this commercial standard.

Date_____

Division of Trade Standards,
National Bureau of Standards,
Washington, D. C.

Gentlemen:

Having considered the statements on the reverse side of this sheet, we accept the Commercial Standard CS12–40 as our standard of practice in the

Production [1] Distribution [1] Use [1]

of fuel oils.

We will assist in securing its general recognition and use, and will cooperate with the standing committee to effect revisions of the standard when necessary.

Signature_____

(Kindly typewrite or print the following lines)

Name and title_____

Company_____
(Fill in exactly as it should be listed)

Street address_____

City and State_____

[1] Please designate which group you represent by drawing lines through the other two. Please file separate acceptances for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interests, trade papers, colleges, etc., desiring to record their general approval, the words "in principle" should be added after the signature.

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. *Enforcement.*—Commercial standards are commodity specifications voluntarily established by mutual consent of those concerned. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but since they represent the will of the interested groups as a whole, their provisions through usage soon become established as trade customs, and are made effective through incorporation into sales contracts by means of labels, invoices, and the like.

2. *The acceptor's responsibility.*—The purpose of commercial standards is to establish for specific commodities, nationally recognized grades or consumer criteria, and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the commercial standard where practicable, in the production, distribution, or consumption of the article in question.

3. *The Department's responsibility.*—The major function performed by the Department of Commerce in the voluntary establishment of commercial standards on a Nation-wide basis is fourfold: first, to act as an unbiased coordinator to bring all interested parties together an unbiased coordinator to bring all branches of the industry together for the satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptance and adherence to the standard on the part of producers, distributors, and users; and fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. *Announcement and promulgation.*—When the standard has been endorsed by a satisfactory majority of production or consumption in the absence of active, valid opposition, the success of the project is announced. If, however, in the opinion of the standing committee or the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.

ACCEPTORS

The organizations and individuals listed below have accepted this specification as their standard of practice in the production, distribution, and use of fuel oils. Such endorsement does not signify that they may not find it necessary to deviate from the standard, nor that producers so listed guarantee all of their products in this field to conform with the requirements of this standard. Therefore specific evidence of quality certification should be obtained where required.

ASSOCIATIONS

American Specification Institute, Chicago, Ill.
American Transit Association, New York, N. Y.
Board of Fire Underwriters of the Pacific, San Francisco, Calif. (In principle.)
Delaware, Automatic Heat & Air Conditioning Association of, Wilmington, Del.
Heating & Piping Contractors District of Columbia Association, Inc., Washington, D. C. (In principle.)
Household Science Institute, Chicago, Ill.
National Association of Purchasing Agents, New York, N. Y.
National Council of Women of the United States, Inc., Consumers' Interest Committee, New York, N. Y. (In principle.)
National Warm Air Heating & Air Conditioning Association, Columbus, Ohio.
New Jersey, Fuel Oil Distributors Association of, Newark, N. J.
Oil Burner Institute, New York, N. Y. (In principle.)
Overlook Hospital Association, Summit, N. J.
Sacramento, Retail Merchants Association of, Sacramento, Calif. (In principle.)
Stove Mounters International Union, St. Louis, Mo.

FIRMS

Acme Oil Burner Co., Inc., Cedar Rapids, Iowa.
Aeroil Burner Co., Inc., West New York, N. J.
Aetna Oil Service, Inc., Louisville, Ky.
Air Conditioning & Oil Heat Magazine, New York, N. Y. (In principle.)
Ajax Petroleum Products Co., Cleveland, Ohio.
Alaska Steamship Co., Seattle, Wash.
Alco Products, New York, N. Y.
Allegany Refiners, Inc., Bolivar, N. Y.
Allen Equipment Co., Baltimore, Md.
Allen Manufacturing Co., Nashville, Tenn.
Alliance Brass & Bronze Co., The, Alliance, Ohio.
Allied Engineering Co., Cleveland, Ohio.
Allied Oil Co., Inc., Cleveland, Ohio.
Allied Oil Corporation, New York, N. Y.
Almy Water Tube Boiler Co., Providence, R. I.
Alton Railroad, The, Baltimore, Md.
American Airlines, Inc., New York, N. Y.
American Bitumuls Co., Baltimore, Md.
American Gas Machine Co., Inc., Albert Lea, Minn.
American Lava Corporation, Chattanooga, Tenn.
American Locomotive Co., Diesel Division, Auburn, N. Y.
American Lubricants, Inc., Buffalo, N. Y.
American Mineral Spirits Co., New York, N. Y.
American Petroleum Co., Cleveland, Ohio.
American Potash & Chemical Corporation, Trona, Calif.
American Smelting & Refining Co., Federated Metals Division, Whiting, Ind.
American Stove Co., Lorain Division, Lorain, Ohio.
American Thermos Bottle Co., The, Norwich, Conn.

Amsco Refining Co., Corpus Christi, Tex.
Anchor Post Fence Co., Baltimore, Md.
Andale Co., Philadelphia, Pa. (In principle.)
Anderson-Prichard Refining Corporation, Oklahoma City, Okla.
Apex Motor Fuel Co., Chicago, Ill.
Argo Oil Corporation, Detroit, Mich.
Arkansas Fuel Oil Co., Shreveport, La.
Arkansas, Baptist State Hospital of, Little Rock, Ark.
Arrow Petroleum Co., Oak Park, Ill.
Ashland Oil & Refining Co., Ashland, Ky.
Associated Factory Mutual Fire Insurance Co., Inspection Department, Boston, Mass. (In principle.)
Atlantic Engineering Co., Atlantic City, N. J.
Atlantic Refining Co., Philadelphia, Pa.
Auler, Jensen & Brown, Oshkosh, Wis.
Aurora Gasoline Co., Detroit, Mich.
Austin Bridge Co., Dallas, Tex.
Auto-Heat Corporation, New York, N. Y.
Automatic Burner Corporation, Chicago, Ill.
Automatic Oil Heating Corporation, Harrisburg, Pa.
Automatic Products Co., Milwaukee, Wis.
Babock & Wilcox Co., The, New York, N. Y.
Baker Oil Burner Products, Denver, Colo.
Baker Perkins, Inc., Saginaw, Mich.
Baldwin, Gerald L., San Diego, Calif.
Ballard Oil Co. of Hartford, Inc., Hartford, Conn.
Ballard Oil & Equipment Co. of Maine, Portland, Maine.
Baltimore & Ohio Railroad, Baltimore, Md.
Barber Asphalt Corporation, Barber, N. J.
Barber Co., W. H., Minneapolis, Minn.
Barnsdall Refining Corporation, Tulsa, Okla.
Bartlett & Snow Co., The C. O., Cleveland, Ohio.
Bastian Morley Co., Inc., La Porte, Ind. (In principle.)
Bay Refining Corporation, Saginaw, Mich.
Bayuk Cigars, Inc., Philadelphia, Pa.
Behr-Manning Corporation, Troy, N. Y.
Bell Co., Inc., The David, Buffalo, N. Y.
Benedict & Co., Inc., New Haven, Conn.
Bennett, Inc., Lawrence J., West Hempstead, N. Y.
Bennett Co., Omaha, Nebr.
Bennis & Sons, Inc., Edward F., Germantown, Philadelphia, Pa.
Bergen, N. J., County of, Board of Chosen Freeholders, Hackensack, N. J.
Berry Asphalt Co., Chicago, Ill.
Berry Sons' Co., Inc., James B., New York, N. Y.
Beshore & Co., Chas., Marion, Ind.
Best Engineering Co., Inc., W. N., New York, N. Y.
Bestrol, Ltd., New York, N. Y.
Bethlehem Foundry & Machine Co., Bethlehem, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Beyer & Fortner, Inc., Lewisburg, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Blanchard Oil Burner Service Co., Arthur, Pittsfield, Mass.
Blithe, Wesley Lesher, Philadelphia, Pa.
Bock Corporation, Madison, Wis.
Bonded Oil System, Inc., Boston, Mass.
Booth, George T., N. Tonawanda, N. Y.
Borden Co., The, Borden's Farm Products Division, New York, N. Y.
Boston Gear Works, Inc., North Quincy, Mass.
Bowers Bros Co., Philadelphia, Pa.
Bradford Oil Refining Co., Bradford, Pa.
Braun Bros. Oil Co., Inc., Winnetka, Ill.
Brazer, Clarence W., New York, N. Y.
Bristol Brass Corporation, Bristol, Conn.
Brockman Engineering Co., New York, N. Y.
Brust, Peter, Milwaukee, Wis.
Buck Engineering Co., Ltd., Freehold, N. J.
Burgess Oil Heating Corporation, Utica, N. Y.
Burkart Schier Chemical Co., Chattanooga, Tenn.
Burns Bros., New York, N. Y.
California Agricultural Experiment Station, Davis, Calif. (In principle.)
California, University of, Davis, Calif. (In principle.)
Cambridge Gas Light Co., Cambridge, Mass.
Camden Heating Co., Camden, N. J.
Caminol Co., Ltd., The, Los Angeles, Calif.
Canfield Oil Co., The, Cleveland, Ohio.
Cannon Electric, Inc., Salisbury, Md.
Cantelou Petroleum Products, S. D., Cleveland, Ohio.
Canton Refining Co., Cleveland, Ohio.
Capitol Coal Corporation, New York, N. Y.
Carborundum Co., Niagara Falls, N. Y.
Carpenter Steel Co., The, Reading, Pa.
Carr Heating & Oil Burners Co., Inc., New Orleans, La.
Carriel Engineering Co., Philadelphia, Pa.
Carter Waters Corporation, The, Kansas City, Mo.
Castle & Co., A. M., Chicago, Ill.
Caterpillar Tractor Co., Peoria, Ill.
Cavalier Corporation, Chattanooga, Tenn.

Center Street Fuel Co., Milwaukee, Wis.
Cen'Tex Petroleum Co., Corpus Christi, Tex., and Tulsa, Okla.
Central Co-operative Wholesale, Superior, Wis.
Centre Oil & Gas Co., Bellefonte, Pa.
Century Engineering Corporation, Cedar Rapids, Iowa.
Century Machine Co., The, Cincinnati, Ohio.
Celluloid Corporation, Newark, N. J.
Chalmers Oil Burner Co., Minneapolis, Minn.
Chapman Coal Co., W. J., Baltimore, Md.
Chesebrough Manufacturing Co., Cons'd., New York, N. Y.
Chicago, City of, Chicago, Ill. (In principle.)
Chicago, Rock Island & Pacific Railway, Chicago, Ill.
Child, Harry C., Sayre, Pa.
Children's Country Home, Westfield, N. J.
Cia. Minera De Penoles S. A., Monterrey, Nuevo Leon, Mexico.
Cities Service Oil Co.,, New York, N. Y., and Tulsa, Okla.
Claflin-Sumner Coal Co., Worcester, Mass.
Clay's Sons, C. M., Poughkeepsie, N. Y.
Cleaver Brooks Co., New York, N. Y.
Cleaver & Co., W. B., Lancaster, Pa.
Cleveland & Son, Frank, Long Valley, N. J.
Cochrane Brass Foundry, York, Pa.
Coen Co., San Francisco, Calif.
Coleman, J. E., Red Bank, N. J.
Coleman Lamp & Stove Co., The, Wichita, Kans.
Collins & Aikman Corporation, Philadelphia, Pa.
Colonial Beacon Oil Co., Boston, Mass.
Col-Tex Refining Co., Oklahoma City, Okla.
Colt's Patent Fire Arms Manufacturing Co., Hartford, Conn.
Columbus Coated Fabrics Corporation, Columbus, Ohio.
Combustion Sales Corporation of New Jersey, Union City, N. J.
Combustrol Equipment Co., Inc., New York, N. Y.
Commander Oil Corporation, Oyster Bay, N. Y.
Commerce Petroleum Co., Chicago, Ill.
Community Laundry Co., Woodside, Long Island, N. Y.
Conklin & Sons Co., Madison, Wis.
Connecticut General Life Insurance Co., Hartford, Conn.
Consumers Petroleum Co., Chicago, Ill.
Continental Baking Co., New York, N. Y.
Continental Refining Co., Oil City, Pa.
Cook's Oil Co., Oakland, Calif.
County Seat Plumbing Supply Co., White Plains, N. Y.
Coverall Service & Supply, Inc., Buffalo, N. Y.
Cram & Ferguson, Boston, Mass.
Crane Co., Chicago, Ill.
Crescent Ins. Wire & Cable Co., Trenton, N. J.
Cressman Motor Co., Souderton, Pa.
Cross Co., Henry H., Chicago, Ill.
Crown Central Petroleum Corporation, Baltimore, Md.
Crystal Oil Refining Corporation, Shreveport, La.
Crystal Oil Works Co., Oil City, Pa.
Cut Bank Refining Co., Cut Bank, Mont.
Dashew, J., Baltimore, Md.
De Jarnette, Charles W., Des Moines, Iowa.
De Laval Separator Co., The, Poughkeepsie, N. Y.
Deep Rock Oil Corporation, Chicago, Ill.
Defler Corporation, Harry R., Buffalo, N. Y.
Delta-Star Electric Co., Chicago, Ill.
Derby Oil Co., Wichita, Kans.
Detroit City Ice & Fuel Co., Detroit, Mich.
Detroit Edison Co., The, Detroit, Mich. (In principle.)
Dexter & Blethen, Dover-Foxcroft, Maine.
Dexter Folder Co., Pearl River, N. Y.
Diamond Iron Works, Inc., Mahr Manufacturing Co., Division of, Minneapolis, Minn.
Dictaphone Corporation, Bridgeport, Conn.
Diesel Dynamics Corporation, New York, N. Y.
Diesel Supply Co., Joplin, Mo.
Dietel, George J., Buffalo, N. Y.
D'Ippolito Oil Co., Vineland, N. J.
Dixie Fuel & Supply Co., Detroit, Mich.
Dodge & Morrison, New York, N. Y.
Dome Oil Co., Inc., Washington, D. C.
Domestic Sales Co., Perth Amboy, N. J.
Dunne, Ralph S., Narberth, Pa.
Eagle Petroleum Co., St. Louis, Mo.
Eastman Kodak Co., Rochester, N. Y.
Ebasco Services, Inc., New York, N. Y. (In principle.)
Economy Service, Inc., Newark, N. J.
Economy Stations, Inc., Hamilton, Ohio.
Edison, Inc., Thomas A., West Orange, N. J.
Edwards, Inc., John, Brooklyn, N. Y.
El Dorado Refining Co., The, El Dorado, Kans.
Electric Boat Co., Groton, Conn.
Electric Boat Co., Electro Dynamic Works of the, Bayonne, N. J.
Electro Refractories & Alloys Corporation, Lackawanna, N. Y.

Electrol, Inc., Clifton, N. J.
Elliott-Lewis Co., Philadelphia, Pa.
Emery Industries, Inc., Cincinnati, Ohio.
Empire Fuel Oil Co., Madison, Wis.
Engineer Co., The, New York, N. Y.
Enterprise Engineering Co. of New England, Boston, Mass.
Estmil Holding Corporation, New York, N. Y.
Excelsior Oil Corporation, Mount Vernon, N. Y.
Fair-Chester Oil Co., Inc., Port Chester, N. Y.
Fairmont Railway Motors, Inc., Fairmont, Minn.
Falley Petroleum Co., Chicago, Ill.
Farmers Union Central Exchange, Inc., St. Paul, Minn.
Filer & Stowell Co., The, Milwaukee, Wis.
Filtered Fuel Oil Corporation, Brooklyn, N. Y.
First National Oil Corporation, Long Island City, N. Y.
Fisler Oil Burners Sales & Service, A. W., Glassboro, N. J.
Flannagan, Eric G., Henderson, N. C.
Fleet Oil Co., Inc., Garden City, N. Y.
Florence Stove Co., Gardner, Mass.
Frankenberg-Rich Engineering Co., Inc., Mount Vernon, N. Y.
Franklin Creek Refining Corporation, Franklin, Pa.
Freedom Oil Co., Freedom, Pa.
Frontier Engineering Corporation, Buffalo, N. Y.
Frontier Fuel Oil Corporation, Buffalo, N. Y.
Fuel Engineering Co. of New York, New York, N. Y. (In principle.)
General Electric, Air Conditioning & Commercial Refrigeration Department, Bloomfield, N. J.
General Motors Corporation, Cadillac Motor Car Division, Detroit, Mich.
General Motors Corporation, Cleveland Diesel Engine Division, Cleveland, Ohio.
Gerhardt, W. F., Richmond, Va.
Gilbert & Barker Manufacturing Co., Springfield, Mass.
Gilmore Oil Co., Los Angeles, Calif.
Globe Oil & Refining Co. of Kansas, McPherson, Kans.
Goddard Fuel Co., Omaha, Nebr.
Goodrich & Co., Inc., Walter H., New Haven, Conn.
Grace Oil Co., Wildwood, N. J.
Gray Industrial Laboratories, Newark, N. J.
Grayslake Gelatin Co., Grayslake, Ill.
Great Lakes Petroleum Co., Milwaukee, Wis.
Greater New York Oil Corporation, Brooklyn, N. Y.
Green Foundry & Furnace Works, Des Moines, Iowa.
Greenwich Coal Co., Inc., Greenwich, Conn.
Greenwood Engineering Co., Inc., Glenarm, Md.
Griffith-Consumers Co., Washington, D. C.
Gulf Oil Corporation, Pittsburgh, Pa.
Gulf Refining Co., Pittsburgh, Pa.
Gustafson Bros. Oil Co., Chicago, Ill.
Hagan Co., George J., Pittsburgh, Pa.
Hall Brothers Oil Co., Dayton, Ohio.
Hansen Oil Co., Burlington, Wis.
Harbor Fuel Co., Inc., Glen Cove, N. Y.
Harley & Ellington, Detroit, Mich. (In principle.)
Harmon-Hodge-Hammond, Inc., New York, N. Y.
Harper & West, Boston, Mass.
Harris, Jay, New York, N. Y.
Harrisburg Steel Corporation, Harrisburg, Pa.
Hart Oil Burner Corporation, Peoria, Ill.
Harvard University, Cambridge, Mass.
Hay Oil Co., Goshen, Ind.
Hayward Manufacturing Co., Inc., Brooklyn, N. Y.
Heating Service Co., Ardmore, Pa.
Heating Supply Co., Inc., Rochester N. Y.
Heil Co., The, Milwaukee, Wis.
Helfensteller, Hirsch & Watson, St. Louis, Mo.
Heller & Durand, Inc., Newark, N. J.
Hemphill & Co., J. L., North Bergen, N. J.
Hendricks' Son, John S., Stockton, N. J.
Hercules Oil Co. of San Diego, Inc., San Diego, Calif.
Hill Diesel Engine Co., Lansing, Mich.
Hochstadter Laboratories, Inc., New York, N. Y. (In principle.)
Hoffman Fuel Co., The Michael, Bridgeport, Conn.
Holtzer-Cabot Electric Co., The, Boston (Roxbury), Mass.
Home Oil Co. of Rochester, Rochester, Minn.
Home Oil & Gas Co., Cedar Rapids, Iowa.
Home Oil & Refining Co., Great Falls, Mont.
Homestead Valve Manufacturing Co., Coraopolis, Pa.
Honolulu Oil Corporation, San Francisco, Calif.
Hopper Co., Inc., F. X., Glenarm, Md.
Hospital Bureau of Standards & Supplies, Inc., New York, N. Y.
Houston, Better Business Bureau of, Houston, Tex. (In principle.)
Howard Fuel Corporation, Brooklyn, N. Y.
Howden Coal & Oil Co., Savannah, Ga.
Hughes Oil Co., Chicago, Ill.

Humble Oil & Refining Co., Houston, Tex.
Hunt Co., Robert W., Chicago, Ill.
Hunter Tractor & Machinery Co., Milwaukee, Wis.
Illinois Farm Supply Co., Chicago, Ill.
Independent Oil Co., The, St. Louis, Mo.
Independent Sales Co., Billings, Mont.
Indian Refining Co., Lawrenceville, Ill.
Ingersoll Rand Co., Phillipsburg, N. J.
Iowa, University Hospitals of, Iowa City, Iowa.
Jacobs, Lionel L., Tenafly, N. J. (In principle.)
Jenkins Bros., Bridgeport, Conn.
Jewett & Sowers Oil Co., The, Chicago, Ill.
Johns Hopkins Hospital, The, Baltimore, Md.
Johns-Manville Corporation, Manville, N. J.
Johnson Co., S. T., Oakland, Calif.
Johnson Oil Refining Co., Chicago, Ill.
Johnston Manufacturing Co., Minneapolis, Minn.
Jones & Co., Inc., T. A. D., New Haven, Conn.
Kalamazoo Stove & Furnace Co., Watertown, Mass.
Kanotex Refining Co., The, Arkansas City, Kans.
Kegan, Frank H., Bloomfield, N. J.
Keich, Robert J., Warren, Ohio.
Keith Oil Corporation, Brockton, Mass.
Kendall Refining Co., Bradford, Pa.
Kendrick Oil Co., Tulsa, Okla.
Kentucky Consumers Oil Co., Inc., Louisville, Ky.
Kern Oil Co., Ltd., Los Angeles, Calif.
Kester Solder Co., Chicago, Ill.
Ketterson, Andrew, Newburgh, N. Y.
Kewanee Boiler Corporation, Kewanee, Ill.
Key West Electric Co., The, Key West, Fla.
Keystone Foundry Co., Lebanon, Pa.
King Engineering Corporation, Ann Arbor, Mich. (In principle.)
Kleen-Heet, Inc., Chicago, Ill.
Korth Oil Burner Corporation, Roselle Park, N. J.
Lafferty, R. S., Camden, N. J.
Landwehr Heating Corporation, Philadelphia, Pa.
Leonard Refineries, Inc., Alma, Mich.
Lennox Furnace Co., Inc., Syracuse, N. Y.
Lewis Associates, Inc., Port Washington, N. Y.
Lewis Coal & Oil Co., Inc., Port Washington, N. Y.
Ley, J. H., Plainview, Minn.
Line Material Co., Milwaukee, Wis.
Lion Oil Refining Co., El Dorado, Ark.
Little, Inc., Arthur D., Cambridge, Mass. (In principle.)
Littleford Bros., Cincin nati, Ohio.
Loizeaux Fuel Co., T. R., Plainfield, N. J.
Long Beach, Better Business Bureau of, Long Beach, Calif. (In principle.)
Loose-Wiles Biscuit Co., Kansas City, Mo.
Loughborough Oil Co., Washington, D. C.
Luxford, R. F., Madison, Wis.
Lycoming Manufacturing Co., Spencer Heater Division, Williamsport, Pa.
M. M. Oil Burner Corporation, Brooklyn, N. Y.
Mack Air Conditioning Corporation, Atlantic City, N. J.
Mack Oil Co., Berwyn, Pa.
Magnolia Petroleum Co., Dallas, Tex.
Marine Biological Laboratory, The, Woods Hole, Mass.
Maritime Oil Co., Houston, Tex.
Maritime Petroleum Corporation, New York, N. Y.
Master Kraft Oil Burner of Queens, Inc., Jamaica, N. Y.
Mathers Fuel Corporation, Philadelphia, Pa.
Mathieson Alkali Works, Inc., The, Niagara Falls, N. Y.
Maunz Co., William C., Buffalo, . Y.
May Oil Burner Corporation, Baltimore, Md.
McCormick Estates, Chicago, Ill.
McElligott Fuel Corporation, Waterbury, Conn.
McIlvaine Burner Corporation, Chicago, Ill.
McIntosh, J. C. & D. F., Canton, Ohio.
McNeily Oil Co., LaGrange, Ill.
Meenan Oil Co., Inc., New York, N. Y.
Messer Co., Inc., The, Newark, N. J.
Metropolitan Coal Co., Boston, Mass.
Miami University, Oxford, Ohio.
Mich-I-Penn Oil & Grease Co., Detroit, Mich.
Micro-Westco., Inc., Bettendorf, Iowa.
Mid-Continent Petroleum Corporation, Tulsa, Okla.
Midland Cooperative Wholesale, Minneapolis, Minn.
Miller, M. C., Westwood, N. J.
Miller Co., The, Meriden, Conn.
Milwaukee Sewerage Commission, Milwaukee, Wis.
Montgomery Ward & Co., Chicago, Ill.
Moore, David H., Atlantic City, N. J.
Motor Wheel Corporation, Duo-Therm Division, Lansing, Mich.
Mudge Co., C. T., Portland, Oreg.
Muhlenberg, Yerkes & Muhlenberg, Reading, Pa.
Multnomah, County of, Portland, Oreg.
Murphy, Inc., J. L., New York, N. Y.
Nantucket Gas & Electric Co., Nantucket, Mass.
Nassau Utilities Fuel Corporation, Roslyn, N. Y.
National Radiator Co., The, Johnstown, Pa.

National Refining Co., The, Cleveland, Ohio.
National Testing Laboratories, Inc., Rochester, N. Y. (In principle.)
Naylor, T. C., Binghamton, N. Y.
Nelson, Albert L., St. Louis, Mo.
Nelson Oil Co., Peekskill, N. Y.
New Haven Coal Co., New Haven, Conn.
New Orleans, Inc., Better Business Bureau of, New Orleans, La. (In principle.)
New Rochelle Coal & Lumber Co., New Rochelle, N. Y.
New York State Department of Public Works, Albany, N. Y.
New York State Reconstruction Home, West Haverstraw, N. Y.
Newton Oil Burner Service, W. L., Inwood, Long Island, N. Y.
Niezer Fuel Co., Fort Wayne, Ind.
Niles Bement Pond Co., Pratt Whitney Division, Hartford, Conn.
North Dakota, State Laboratories Department of, Bismarck, N. Dak.
North Shore Fuel Oil Co., Inc., Long Island City, N. Y.
Northern Controlled Heat Co., Inc., Watertown, N. Y.
Northern Equipment Co., Erie, Pa.
Northwestern Foundry Co., Chicago, Ill.
Northwestern Oil Co., Superior, Wis.
Norton Co., Worcester, Mass.
Nu-Way Corporation, The, Rock Island, Ill.
Ohio Oil Co., The, Findlay, Ohio.
Oil Creek Refining Co., Titusville, Pa.
Oil & Gas Journal, The, Tulsa, Okla.
Oil Products, Inc., Island Park, N. Y.
Oilomatic Heating Co., Inc., Reading, Pa.
Old Dutch Refining Co., Muskegon, Mich.
Orange Memorial Hospital, Orange, N. J.
Orr, Benjamin N., New York, N. Y.
Orr & Sembower, Inc., Reading, Pa.
Osher & Reiss, Inc., Brooklyn, N. Y.
Owens, J. M., Norristown, Pa.
Pan-American Engineering Co., Berkeley, Calif.
Panhandle Refining Co., Wichita Falls, Tex.
Panhard Oil Corporation, New York, N. Y.
Paragon Oil Co., Inc., New York, N. Y., and Brooklyn, N. Y.
Park Oil Co., Roanoke, Va.
Patchogue Oil Terminals Corporation, Brooklyn, N. Y.
Pate Oil Co., Milwaukee, Wis.
Paterson General Hospital, Paterson, N. J.
Patterson & Co., Inc., Joseph M., Philadelphia, Pa.
Peaster Oil Co., Winnetka, Ill.
Pehrson, G. A., Spokane, Wash.
Penn Electric Switch Co., Goshen, Ind.
Penn Service Oil Co., Reading, Pa.
Pennsylvania Hospital, Philadelphia, Pa.
Pennsylvania Oil Co., Boston, Mass.
Pennsylvania Oil Products Refining Co., Warren, Pa.
Pennsylvania Refining Co., Butler, Pa.
Pennsylvania State College, Engineering Experiment Station, State College, Pa.
Pennzoil Co., The, Oil City, Pa.
Peoples Coal & Fuel Oil Co., Phoenixville, Pa.
Perfection Stove Co., Cleveland, Ohio.
Permutit Co., The, Birmingham, N. J.
Peterson Co., George C., Chicago, Ill.
Petro Summit Oil Burner Co., Inc., Summit, N. J.
Petrol Corporation, The, Los Angeles, Calif.
Petroleum Heat & Power Co., Stamford, Conn.
Petroleum Heat & Power Co., Inc., New York, N. Y.
Petroleum Products, Inc., Kansas City, Mo.
Petroleum Transport Co., York, Pa.
Petrometer Corporation, Long Island City, N. Y. (In principle.)
Peyton & Co., Klamath Falls, Oreg.
Pfizer & Co., Inc., Chas., New York, N. Y.
Philadelphia Drying Machinery Co., The, Philadelphia, Pa.
Philadelphia Electric Co., Philadelphia, Pa.
Phillips Petroleum Co., Bartlesville, Okla.
Phoenix Chemical Laboratory, Inc., Chicago, Ill.
Pierce Oil Co., The C. A., Akron, Ohio.
Pneumatic Scale Corporation, Ltd., Quincy, Mass.
Pocomoke Foundry & Machine Works, Pocomoke City, Md.
Power Plant Engineering, Chicago, Ill.
Preferred Oil Co., Inc., Brooklyn, N. Y.
Preferred Utilities Co., Inc., New York, N. Y.
Primrose Petroleum Co., Dallas, Tex.
Public Service Oil Co., Inc., New York, N. Y.
Pure Oil Co., The, Chicago, Ill.
Putnam-Drake Corporation, Syracuse, N. Y.
Quaker Manufacturing Co., Chicago, Ill.
Quality Bakers of America, New York, N. Y.
Queens Petro Co., Inc., Jamaica, Long Island, N. Y.
Quincy Oil Co., The, Quincy, Mass.
R–S Products Corporation, Philadelphia, Pa.
Rackliffe Oil Co., The, New Britain, Conn.
Ramsey, Wm. H. C., Bryn Mawr, Pa.
Ray Oil Burner Co., San Francisco, Calif.

Reid, William H., Jr., Billings, Mont.
Reif-Rexoil, Inc., Buffalo, N. Y.
Remington Arms Co., Inc., Ilion, N. Y.
Renown Stove Co., Owosso, Mich.
Republic Oil Co., Pittsburgh, Pa.
Rex Oil Refinery, Rapid City, S. Dak.
Reynolds Research Corporation, South Kearny, N. J.
Richards Fuel Oils, Somerville, N. J.
Richardson & Gray, Boston, Mass. (In principle.)
Richfield Oil Corporation of New York, New York, N. Y.
Rochester, Fire Prevention Division of, Rochester, N. Y.
Rockford Drop Forge Co., Rockford, Ill.
Rockwell Co., W. S., New York, N. Y.
Roosevelt Oil Co., Mount Pleasant, Mich.
Ross Heater & Manufacturing Co., Inc., Buffalo, N. Y.
Royce, William, Lakeside, Mich.
S & W Heating Co., Inc., Worcester, Mass.
Sahara Service Station, Fairfield, Ill.
Saint John's Hospital, Brooklyn, N. Y.
Saunders Petroleum Co., Kansas City, Mo.
Schock Independent Oil Co., Mount Joy, Pa.
Schoeppe, Edward, Philadelphia, Pa.
Schrafft, & Sons Corporation W. F., Boston, Mass.
Schultz Co., Inc., W. R., North Scituate, Mass.
Schutte & Koerting Co., Philadelphia, Pa.
Scotch Plains Township, Scotch Plains, N. J. (In principle.)
Scranton Better Business Bureau, Scranton, Pa. (In principle.)
Seabo, Inc., Charles P., Paulsboro, N. J.
Seaford Plumbing Supply Co., Seaford, Del.
Sears, Roebuck & Co., Chicago, Ill.
Seaside Oil Co., Santa Barbara, Calif.
Sego Milk Products Co., Salt Lake City, Utah.
Seymour Manufacturing Co., The, Seymour, Conn.
Shallow Water Refining Co., Scott City, Kans.
Shedlov Oil Burners, Inc., Minneapolis, Minn.
Shell Oil Co., Inc., New York, N. Y.
Shellenberger, Gregg & Co., Milwaukee, Wis.
Shipley, Inc., Thomas, York, Pa.
Silent Sioux Oil Burner Corporation, Orange City, Iowa.
Sims Co., The, Erie, Pa.
Smith, H. E., White Plains, N. Y. (In principle.)
Smith Co., Inc., The H. B., Westfield, Mass.
Smith Corporation, A. O., Milwaukee, Wis.
Smith Oil & Refining Co., Rockford, Ill.
Smith Paper Mills, Ltd., Howard, Cornwall, Ontario, Canada.
Smith Utilities, Inc., Warriner, Spring Valley, N. Y.
Socony-Vacuum Oil Co., Inc., Eastern Marketing Division, New York, N. Y.
Socony-Vacuum Oil Co., Inc. (Lubrite Division), St. Louis, Mo.
Sonneborn Sons, Inc., Daugherty Refinery Division, Petrolia, Pa.
South Dakota, State of, State Chemical Laboratory, Vermillion, S. Dak. (In principle.)
Souther Engineering Co., The Henry, Hartford, Conn.
Southern Oil Service, Nashville, Tenn.
Southern Pacific Co., San Francisco, Calif.
Southern States Cooperative, Inc., Baltimore, Md.
Spear Stove & Heating Co., James, Philadelphia, Pa.
Specification Record, Chicago, Ill.
Sprenkle Sales Co., H. H., York, Pa.
Springfield Coal Co., Springfield, Mass.
Standard Oil Co. of California, San Francisco, Calif.
Standard Oil Co., Incorporated in Kentucky, Louisville, Ky.
Standard Oil Co. of Louisiana, New York, N. Y.
Standard Oil Co. of New Jersey, New York, N. Y.
Standard Oil Co. (Ohio), The, Cleveland, Ohio.
Standard Oil Co. of Pennsylvania, Philadelphia, Pa.
Standard Oil Co. of Texas, San Francisco, Calif.
Standard Tool Co., The, Cleveland, Ohio.
Stanley Works, The—American Tube & Stamping Plant, Bridgeport, Conn.
Starkweather Engineering Co., Inc., Newton, Mass.
Staten Island Home Utilities Co., Inc., Port Richmond, Staten Island, N. Y.
Steam & Combustion Co., Racine, Wis.
Steinhardt, Inc., J. M., Albany, N. Y.
Sterling Fuel Oil Corporation, Chicago, Ill.
Stillman & Van Siclen, Inc., New York, N. Y. (In principle.)
Stoetzel, Ralph E., Chicago, Ill. (In principle.)
Stoll Oil Refining Co., Inc., Louisville, Ky.
Stuart Co., W. W., Des Moines, Iowa.
Suburban Fuel Oil Service, Inc., Houston, Tex.
Sun Oil Co., Philadelphia, Pa.
Sundstrand Engineering Co., Rockford, Ill.
Sunrise Oil Co., Inc., College Point, N. Y.
Super Plumbing & Heating Co., Union City, N. J.
Swarthmore Heating Service, Swarthmore, Pa.

Sylvestre Oil Co., Inc., Mount Vernon, N. Y.
Syncro-Flame Burner Corporation, Willimantic, Conn.
Talco Asphalt & Refining Co., Mount Pleasant, Tex.
Tate-Jones & Co., Inc., Leetsdale, Pa.
Texas Co., The, New York, N. Y.
Thompson, A. W., East Stroudsburg, Pa.
Thompson Products, Inc., Cleveland, Ohio.
Throop Petroleum Co., J. V., Ypsilanti, Mich.
Tide Water Associated Oil Co., New York, N. Y., and San Francisco, Calif.
Timken Detroit Axle Co., The, Timken Silent Automatic Division, Detroit, Mich.
Timken Roller Bearing Co., The, Canton, Ohio.
Torrence Oil Co., Birmingham, Mich.
Town & Country Oil Corporation, Mount Vernon, N. Y.
Trumbull Asphalt Co., Chicago, Ill.
Trumbull Electric Manufacturing Co., The, Plainville, Conn.
Tuffley Burner Corporation, Buffalo, N. Y.
Two Park Avenue Building, Inc., New York, N. Y.
Uhl, Otto, Jr., East Elmhurst, Long Island, N. Y.
Ultra-Penn Refining Co., Butler, Pa.
Underwriters' Laboratories, Inc., Chicago, Ill., and New York, N. Y. (In principle.)
Union Oil Co. of California, Los Angeles, Calif.
United Co-Operative, Inc., Indianapolis, Ind. (In principle.)
United Equipment & Supply Co., Washington, D. C.
United Laboratories, Wichita, Kans.
United Light & Power Service Co., The, Davenport, Iowa.
United Oil Manufacturing Co., Erie, Pa.
United Refining Co., Warren, Pa.
Universal Oil Products Co., Riverside, Ill. (In principle.)
Updike Lumber & Coal Co., Omaha, Nebr.
Utah Oil Refining Co., Salt Lake City, Utah.
Utica Oil Heating Corporation, Utica, N. Y.
Vickers Petroleum Co. of Delaware, The, Wichita, Kans.
Viett Co., Rockville, Md.
Virginia Polytechnic Institute, Blacksburg, Va.
Volcanic Specialties Co., The, Alliance, Ohio.
Walker & Pratt Manufacturing Co., Watertown, Mass.
Walsh, William H., Chicago, Ill.
Waltham, Mass., City of, Waltham, Mass.
Walworth Co., South Boston, Mass.
Washington Gas Light Co., Washington, D. C.
Washington, State of, Olympia, Wash.
Waterside Fuel Oil Corporation, Brooklyn, N. Y.
Wauwatosa Fuel & Supply Co., Wauwatosa, Wis.
Waverly Oil Works Co., Pittsburgh, Pa.
Wayne Oil Burner Corporation, Fort Wayne, Ind.
Webaco Oil Co., Inc., Webster, N. Y.
Webster Electric Co., Racine, Wis.
Wells Petroleum Co., Chicago, Ill.
Wesleyan University, Middletown, Conn.
Western Oil Co., Somerville, Mass.
Western Oil & Fuel Co., Minneapolis, Minn.
Western Petroleum Co., Omaha, Nebr.
Whale Oil Co., Inc., Brooklyn, N. Y.
White Laboratories, Inc., Newark, N. J.
Whitlock Coil Pipe Co., The, Hartford, Conn.
Wilcox, Crittenden & Co., Inc., Middletown, Conn.
Wilcox Refining Division, Tulsa, Okla.
Willatsen, Andrew, Seattle, Wash.
Williams Oil-O-Matic Heating Corporation, Bloomington, Ill.
Wilshire Oil Co., Los Angeles, Calif.
Wilson & Co., Inc., Chicago, Ill.
Winkler-Koch Engineering Co., The, Wichita, Kans. (In principle.)
Wisconsin Ice & Coal Co., Milwaukee, Wis.
Witschy Bros. Oil Co., Scottsbluff, Nebr. (In principle.)
Witte Engine Works, Kansas City, Mo.
Wolverine-Empire Refining, Co., Oil City, Pa.
Wolverine Fuel Service Co., Lansing, Mich.
Wolverine Service Stations, South Haven, Mich.
Yale & Towne Manufacturing Co., The, Stamford, Conn.
Yerly Coal Co., La Crosse, Wis.
Young Heat Engineering Co., Billings, Mont.
Zindorf, Robert, Annapolis, Md.

U. S. GOVERNMENT

Agriculture, U. S. Department of, Washington, D. C. (In principle.)
Interior, U. S. Department of the, National Park Service, Yellowstone National Park, Yellowstone Park, Wyo.
Naval Engineering Experiment Station, Annapolis, Md. (In principle.)
Treasury Department, Washington, D. C.
Veterans' Administration, Washington, D. C.
War Department, Washington, D. C.

COMMERCIAL STANDARDS

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2-30.	Mopsticks.
3-38.	Stoddard solvent (second edition).
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49-34.	Chip board, laminated chip board, and miscellaneous boards for bookbinding purposes.
50-34.	Binders board for bookbinding and other purposes.
51-35.	Marking articles made of silver in combination with gold.
52-35.	Mohair pile fabrics (100-percent mohair plain velvet, 100-percent mohair plain frieze, and 50-percent mohair plain frieze).
53-35.	Colors and finishes for cast stone.
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55-35.	Mattresses for institutions.
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79-39.	Blown, drawn, and dropped lenses for sun glasses.

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