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CS122-45

Plywood; Hemlock, Western

UNITED STATES DEPARTMENT OF COMMERCE

HENRY A. WALLACE, Secretary

NATIONAL BUREAU OF STANDARDS

LYMAN J. BRIGGS, Director

WESTERN HEMLOCK PLYWOOD

COMMERCIAL STANDARD CS122-45

Effective Date for New Production From March 5, 1945

A RECORDED VOLUNTARY STANDARD
OF THE TRADEUNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1915

PROMULGATION
of
COMMERCIAL STANDARD CS122-45
for
WESTERN HEMLOCK PLYWOOD

On August 26, 1944, at the instance of the Douglas Fir Plywood Association, a proposed commercial standard for Western hemlock plywood was circulated to leading distributor and user organizations, Government agencies, and to manufacturers for comment. Following adjustment in the light of the comment, the recommended commercial standard was circulated on November 18, 1944, to the entire trade for written acceptance.

Those concerned have since accepted and approved the standard as shown herein for promulgation by the United States Department of Commerce, through the National Bureau of Standards.

The standard is effective for new production from March 5, 1945.

Promulgation recommended.

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

Promulgated.

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

Promulgation approved.

Henry A. Wallace,
Secretary of Commerce.

WESTERN HEMLOCK PLYWOOD

COMMERCIAL STANDARD CS122-45

PURPOSE

1. Because of the increasing economic importance of Western hemlock, Noble fir, and the commercial white firs in the manufacture of plywood, the following standard grading rules are offered as a universal basis of understanding in the industry. General adoption and use of this standard will facilitate procurement of the proper grade of material for its varied uses and provide a better understanding between buyer and seller. Architects, engineers, contractors, industrial users, and home owners will thus be able to specify their needs from nationally accepted grading standards.

SCOPE

2. These rules cover four grades of moisture-resistant-type Western hemlock plywood; a laminated board for paneling, sheathing, cabinet work, and many structural and industrial uses. In addition there are included tests, standard sizes, size tolerances, reinspection rules, and nomenclature and definitions.

DEFINITION

3. Western hemlock plywood is a built-up board of laminated veneers in which the grain of each piece is at right angles to the one adjacent to it. The kiln-dried veneer is united under high pressure with a bonding agent, making the joints as strong as or stronger than the wood itself. The alternating direction of the grain with each contiguous layer of wood equalizes the strains and in this way minimizes shrinkage and warping of the product and prevents splitting. Western hemlock plywood shall admit the use of Noble fir and the commercial white firs; also Douglas-fir may be used for cores and crossbands. Western hemlock plywood is made only in the moisture-resistant type and is not intended for permanent exterior use.

GENERAL REQUIREMENTS

4. All Western hemlock plywood sold as of commercial standard quality shall meet the following general requirements.

5. *Workmanship*.—Unless otherwise specified, Western hemlock plywood shall be smoothly sanded on two sides. When rough or unsanded plywood is specified it may have paper tape on either face or back, or both. It shall be well manufactured and free from blisters,

laps, and defects, except as permitted in the specific rules for the various grades.

6. *Bonding*.—The entire area of each contacting surface of the plywood shall be bonded in an approved manner with a moisture-resistant-type adhesive. No tape shall be permitted in the glue line. This type of plywood possesses a high degree of moisture resistance, where its application requires that it shall retain its original form and practically all its strength when occasionally subjected to a thorough wetting and subsequent normal drying. This type of plywood is suitable for construction where subjected to occasional deposits of moisture by condensation through walls or leakage or from other sources. This type shall meet the test requirements set forth in paragraphs 14 and 15.

7. *Veneers*.—Veneers $\frac{1}{2}$ inch or more in thickness shall be used in the construction of panels $\frac{1}{4}$ inch and upward in thickness. No veneer shall be used thicker than $\frac{3}{16}$ inch. The veneer thickness shall be measured before the panel is sanded.

8. *Loading or packing*.—All plywood shall be securely loaded or packed to insure delivery in a clean and serviceable condition.

DETAIL REQUIREMENTS

9. Western hemlock plywood shall be graded according to both sides of the piece, into the various grades hereinafter defined. The grade description sets forth the minimum requirements and, therefore, the majority of panels in any shipment will exceed the specifications given. Suitable grade marks shall appear on all standard panels.

10. *Sound 2 sides (SO2S) (sanded 2 sides)*.—Each face shall be of one or more pieces of firm, smoothly cut veneer. When of more than one piece, it shall be well joined and reasonably matched for grain and color at the joints. It shall be free from knots, splits, bark pockets, and other open defects. Black streaks (if not open), discolorations, sapwood, shims, and neatly made patches shall be admitted. This grade shall present a smooth surface suitable for painting.

11. *Sound 1 side (SO1S) (sanded 2 sides)*.—The face shall be of one or more pieces of firm, smoothly cut veneer. When of more than one piece, it shall be well joined and reasonably matched for grain and color at the joints. It shall be free from knots, splits, bark pockets, and other open defects. Black streaks (if not open), discolorations, sapwood, shims, and neatly made patches shall be admitted. The face shall present a smooth surface suitable for painting. The back may contain knots, knotholes not greater than 1 inch in greatest dimension, splits not wider than $\frac{3}{16}$ inch, and bark pockets and other defects that will not seriously affect the strength or serviceability of the panel. There may be any number of patches and plugs in the back.

12. *Sheathing (unsanded)*.—This grade is made only in the following sizes: Thicknesses $\frac{1}{16}$ inch and $\frac{3}{16}$ inch 3-ply; $\frac{1}{2}$ inch and $\frac{5}{8}$ inch 5-ply;

width 48 inches; length 96 inches. The face may contain the following: (a) Not more than 10 knotholes, none of which shall exceed $1\frac{1}{2}$ inches with not more than 5 exceeding $\frac{3}{4}$ inch in greatest dimension; (b) no group of knotholes within any 12-inch-diameter circle shall have an aggregate greatest dimension more than 3 inches; (c) no splits wider than $\frac{1}{8}$ inch; or any type of borer holes longer than 1 inch; or open bark pockets or other open defects more than 1 inch wide. There may be any number of patches and plugs in the face. No belt sanding is permissible. The back may contain knotholes or bark pockets, splits, and other defects in number and size that will not seriously affect the strength or serviceability of the panel. No knotholes shall be admitted greater than $2\frac{1}{2}$ inches in least dimension, no splits wider than $\frac{3}{4}$ inch, at widest point, no open defects greater than $1\frac{1}{2}$ inches by 4 inches or equivalent area and no open defects which extend through two adjacent veneers at same point.

13. *Industrial (unsanded)*.—Faces of panel shall be free from both knotholes and borer holes more than $\frac{5}{8}$ inch in greatest dimension, and open bark pockets more than $\frac{5}{8}$ inch wide. Tight knots, checks, plugs, patches, and shims shall be admitted in either face. Core and crossbands shall be of firm stock but shall contain no knotholes greater than $1\frac{1}{4}$ inches in any dimension.

TESTS

14. *Sampling*.—Samples for testing shall be taken from 1 percent of the panels in any shipment, but not less than 5 and not more than 10 panels shall be selected. From each panel selected a test piece shall be cut from each end, approximately at midwidth of the panel, and from each edge approximately at midlength of the panel, while a fifth piece shall be cut from somewhere near the middle or center of the panel.

15. *Test*.—One test sample 6 by 6 inches shall be taken from each test piece. They shall be submerged in fresh tap water at room temperature for a period of 4 hours, followed by drying at a temperature not to exceed 100° F. for a period of 20 hours. This cycle shall be repeated a second time, after which the test samples must not show more than 2 inches of delamination along the edge.

16. *Interpretation of tests*.—If there is failure of more than one test piece from any panel, that specific panel shall be rejected. If there is a failure in any of the panels tested, five additional panels shall be selected and tested under the conditions described, and all of these five panels must pass the required test. If the panels do not pass such test, a reinspection may be demanded by either buyer or seller as provided for in paragraphs 20 to 22.

STANDARD SIZES

17. Western hemlock plywood is made in the standard sizes given in table 1.

TABLE 1.—Standard Western hemlock plywood sizes

Grade	Width	Length	Thickness
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
(SO2S) (SO1S).	24	60	$\frac{1}{8}$ (3 ply, sanded 2 sides).
	30	72	$\frac{3}{16}$ (3 ply, sanded 2 sides).
	36	84	$\frac{1}{4}$ (3 ply, sanded 2 sides).
	48	96	$\frac{3}{8}$ (3 ply, sanded 2 sides).
		108	$\frac{1}{2}$ (5 ply, sanded 2 sides).
		120	$\frac{5}{8}$ (5 ply, sanded 2 sides).
		144	$\frac{3}{4}$ (5 ply, sanded 2 sides).
Sheathing.	48	96	$\frac{5}{16}$ (3 ply, unsanded).
			$\frac{3}{8}$ (3 ply, unsanded).
			$\frac{1}{2}$ (3 or 5 ply, unsanded).
			$\frac{5}{8}$ (3 or 5 ply, unsanded).
Industrial.	As ordered up to 48.	As ordered up to 96.	$\frac{1}{4}$ (3 ply, unsanded).
			$\frac{5}{16}$ (3 ply, unsanded).
			$\frac{3}{8}$ (3 ply, unsanded).
			$\frac{1}{2}$ (5 ply, unsanded).
			$\frac{9}{16}$ (5 ply, unsanded).
			$\frac{5}{8}$ (5 ply, unsanded).
			$\frac{11}{16}$ (5 ply, unsanded).
			$\frac{3}{4}$ (5 ply, unsanded).
			$\frac{7}{8}$ (5 ply, unsanded).
			$\frac{7}{8}$ (7 ply, unsanded).

SIZE TOLERANCE

18. A tolerance of $\frac{1}{64}$ (0.0156) inch over or under the specified thickness shall be allowed on sanded panels and a tolerance of $\frac{1}{32}$ (0.0312) inch on unsanded panels.

19. A tolerance of $\frac{1}{32}$ (0.0312) inch over or under the specified length and/or width shall be allowed, but all panels shall be square within $\frac{1}{8}$ (0.1250) inch.

INSPECTION

20. All plywood guaranteed to conform to the commercial standard grading rules is sold subject to inspection in the white only. All complaints regarding the quality of any shipment must be made within 15 days from receipt thereof.

21. If the grade of any plywood shipment is in dispute and a reinspection is demanded, the cost of such reinspection shall be borne by the seller and the shipment settled for on the basis of the reinspection report if the shipment is more than 5 percent below grade, or if it contains more than 1 percent of mismanufactured panels containing defects such as short core, lapped core, blisters, delamination, etc., which render the panel unfit for normal use. The buyer need accept no such defective panels shipped as any standard grade listed in this commercial standard.

22. If reinspection establishes the shipment to be 5 percent or less below grade, and to contain 1 percent or less of mismanufactured panels, the buyer shall pay the cost of reinspection and shall pay for the shipment as invoiced.

GRADE MARKING AND CERTIFICATION

23. In order to assure the purchaser that he is getting plywood of the grade specified, producers may individually or in concert with their trade association or Inspection Bureau, issue certificates with each shipment; or grade mark each panel as conforming to the standard.

24. The following sets forth the grade marks adopted by the Douglas Fir Plywood Association to preserve the high standard of quality herein recorded and to insure distributors and ultimate consumers receiving the proper kind of plywood for specific needs. All standard size panels are stamped or branded with the following symbols which indicate compliance with the respective grades of this standard.

- (a) *Sound 2 sides* panels are stamped or branded on the edge:

So2S ★ SILVALOCK ★ OO

- (b) *Sound 1 Side* panels are stamped or branded on the back:



- (c) *Sheathing* panels are stamped or branded on the face:



- (d) *Industrial* panels are stamped or branded on the edge:

IND ★ SILVALOCK ★ OO

NOMENCLATURE AND DEFINITIONS

Back.—The side reverse to the face of the panel.

Bark pocket.—Patches of bark partially or wholly enclosed in the wood.

Borer holes.—Voids made by wood-boring insects or worms.

Centers.—See cores.

Checks.—Small splits running parallel to the grain of the wood caused chiefly by strains produced in seasoning.

Cores.—Cores or centers are the innermost layer in plywood construction.

Crossbanding.—Veneer used in the construction of plywood with five or more plies. In 5-ply construction it is placed at right angles between the core and faces.

Defects, open.—Checks, splits, open joints, cracks, loose knots, and other defects interrupting the smooth continuity of the surface.

Face.—The better side of a panel in any grade calling for a face and a back; also, either side of a panel where the grading rules draw no distinction between faces.

Heartwood.—The darker-colored wood occurring in the inner portion of the tree, sometimes referred to as "heart."

Knots.—Cross-section of a branch or limb whose grain usually runs at right angles to that of the piece in which it is found.

Knotholes.—Voids produced by the dropping of knots from the wood in which they were originally embedded.

Lap.—A condition where the veneers used are so misplaced that one piece overlaps the other rather than making a smooth butt joint.

Patches.—Insertions of sound wood glued and placed into panels from which defective portions have been removed.

Sapwood.—The lighter-colored wood occurring in the outer portion of the tree, sometimes referred to as "sap."

Shim.—A long, narrow patch not more than $\frac{3}{16}$ inch wide.

Split.—Lengthwise separation of the wood extending through the piece of veneer.

Streaks.—A streak is a discoloration caused by an accumulation of resinous substance or chemical change within the wood.

EFFECTIVE DATE

25. The standard is effective for new production from March 5, 1945.

STANDING COMMITTEE

26. The following individuals comprise the membership of the standing committee, which is to review, prior to circulation for acceptance, revisions proposed to keep the standard abreast of progress. Each organization nominated its own representative. Comment concerning the standard and suggestions for revision may be addressed to any member of the committee or to the Division of Trade Standards, National Bureau of Standards, which acts as secretary for the committee.

NORMAN O. CRUVER (Chairman), The Wheeler, Osgood Co., 1216 St. Paul Ave., Tacoma 1, Wash.
W. C. BAILEY, United States Plywood Corporation, 1319 W. Nickerson St., Seattle 99, Wash.
A. R. WELCH, West Coast Plywood Co., P. O. Box 1180, Aberdeen, Wash.
N. S. PERKINS, Douglas Fir Plywood Association, Tacoma Bldg., Tacoma 2, Wash.
JOSEPH KRAMER, Greater New York Lumber Industries, Inc., 182 W. 42d St., New York 18, N. Y.
T. F. ECKSTROM, Pacific Mutual Door Co., Tacoma Bldg., Tacoma 2, Wash. (Representing National-American Wholesale Lumber Association).
National Plywood Distributors Association, Inc. (Invited to name a representative.)
Carolina Lumber & Building Association. (Invited to name a representative).
JAMES M. ALEXANDER, Cavalier Corporation, Chattanooga 2, Tenn. (Representing National Association of Purchasing Agents).
HARRY H. STEIDLE, Prefabricated Home Manufacturers' Institute, 1244 Shoreham Bldg., 15th and H Sts. NW., Washington 5, D. C.
BURT L. KNOWLES, Building Contractors' Division, The Associated General Contractors of America, Inc., Munsey Bldg., Washington 4, D. C.
Federal Housing Administration, National Housing Agency, (Invited to name a representative.)

HISTORY OF PROJECT

27. On March 17, 1944, the Douglas Fir Plywood Association requested the cooperation of the National Bureau of Standards in the establishment of a commercial standard for Western hemlock plywood. A draft of the proposed commercial standard was submitted on August 26, 1944, to producers, interested testing laboratories, and distributor and user organizations for their review and comment. After the requirements were harmonized and adjusted so that the draft represented the composite views of all interested groups, the recommended standard was circulated on November 18, 1944, to the trade for written acceptance.

28. Upon receipt of official acceptances estimated to represent a satisfactory majority of the production volume, and in the absence of active valid opposition, the standard was promulgated as Commercial Standard CS122-45, effective for new production from March 5, 1945.

ACCEPTANCE OF COMMERCIAL STANDARD

If acceptance has not previously been filed, 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 25, D. C.

Gentlemen:

We believe that the Commercial Standard CS122-45 constitutes a useful standard of practice, and we individually plan to utilize it as far as practicable in the

Production ¹ Distribution ¹ Use ¹ Testing ¹

of Western hemlock plywood.

We reserve the right to depart from it as we deem advisable.

We understand, of course, that only those articles which actually comply with the standard in all respects can be identified or labeled as conforming thereto.

Signature of authorized officer_____

(In ink)

(Kindly typewrite or print the following lines)

Name and title of above officer_____

Organization_____

(Fill in exactly as it should be listed)

Street address_____

City, zone, and State_____

¹ Underscore which one. Please see that separate acceptances are filed for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interests, trade papers, etc., desiring to record their general support, the words "General Support" 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 for the mutually 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

29. The organizations listed below have individually accepted these grading rules for use as far as practicable in the production, distribution, testing or use of Western hemlock plywood. In accepting the standard they reserved the right to depart therefrom as they individually deem advisable. It is expected that articles which actually comply with the requirements of this standard in all respects will be regularly identified or labeled as conforming thereto, and that purchasers will require such specific evidence of conformity.

ASSOCIATIONS

American Specification Institute, Chicago, Ill.
American Veneer Package Association, Inc., Washington, D. C. (General support.)
American Wood Institute, Inc., New York, N. Y.
Associated General Contractors of America, Inc., Washington, D. C., and Chicago, Ill.
Building Officials Conference of America, Washington, D. C.
Carolina Lumber & Building Supply Association, Charlotte, N. C. (General support.)
Douglas Fir Plywood Association, Tacoma, Wash. (General support.)
Michigan Association of Traveling Lumber Sash & Door Salesmen, Detroit, Mich.
North East Lumbermen's Association, Columbia, Mo. (General support.)
Prefabricated Home Manufacturers' Institute, Washington, D. C.
Producers' Council, Inc., The, Washington, D. C. (General support.)
Southern California Retail Lumber Association, Los Angeles, Calif.
Veneer Association, The, Chicago, Ill. (General support.)
West Coast Lumbermen's Association, Seattle, Wash. (General support.)

FIRMS

Abel, Inc., Seattle, Wash.
Aberdeen Plywood Corporation, Aberdeen, Wash.
Adams, Franklin O., Tampa, Fla.
Addison-Rudesal Co., Atlanta, Ga.
Aetna Plywood & Veneer, Chicago, Ill.
Aladdin Co., The, Bay City, Mich.
Albany-Plylock Division, M & M Wood Working Co., Albany, Oreg.
Altfillisch, Charles, Decorah, Iowa.
American Car & Foundry Co., St. Louis, Mo.
American Plywood Corporation, New London, Wis.
American Sash & Door Co., Kansas City, Mo.
Am-Mex Sales Co., Inc., Buffalo, N. Y.
Anacortes Veneer, Inc., Anacortes, Wash.
Andrews, Jones, Biscoe & Goodell, Boston, Mass.
Angelina County Lumber Co., Keltys, Tex.
Armstrong-Walker Lumber Co., Terre Haute, Ind.
Ashby Lumber Co., The T. W., Billings, Mont.
Asheim, Leonard, Bridgeport, Conn.
Arizona Sash, Door & Glass Co., Phoenix, Ariz.
Ashton Co., C. J., Detroit, Mich.
Associated Plywood Mills, Olympia, Wash.
Atkinson-Stutz, San Francisco, Calif.
Atlantic Plywood Co., Inc., New York, N. Y.
Austin, Ennis R., South Bend, Ind.
Austin Lumber Co., Pittsburgh, Pa.
Bakelite Corporation, New York, N. Y. (General support.)
Balfour, Guthrie & Co., Ltd., Tacoma, Wash.
Barnes Lumber Co., W. F. & J. F., Waco, Tex.
Beasley & Sons Co., Nashville, Tenn.
Bellingham Plywood Corporation, Bellingham, Wash.
Bennett-Bailey Lumber Co., Minneapolis, Minn.
Besch Co., The Carl, New York, N. Y.
Beuttler, William, Sioux City, Iowa.
Bevil & Co., Portland, Oreg.

Binswanger & Co., Inc., Richmond, Va.
Bishop, Horatio W., La Mesa, Calif.
Blackburn, Inc., Robert, W. Allis, Wis.
Blithe, Wesley Leshner, Philadelphia, Pa.
Bloom Co., The Alfred, Omaha, Nebr.
Boehm, George A., New York, N. Y.
Botsford Lumber Co., Winona, Minn.
Brainerd, Harry B., New York, N. Y.
Brand, Herbert A., Chicago, Ill.
Brazier, Clarence W., New York, N. Y.
Brill Co., The J. G., Philadelphia, Pa.
Bruett Lumber, Inc., T. A., Milwaukee, Wis.
Buckeye Mill & Lumber Co., Jackson, Ohio.
Buechner & Orth, St. Paul, Minn.
Buffalo, City of, Department of Public Works, Architectural Service, Buffalo, N. Y.
Buffalo Plywood Corporation, Buffalo, N. Y.
Buffelen Lumber & Manufacturing Co., Tacoma, Wash.
Builders Supply Co., Bismarck, N. Dak.
Building Service, Inc., Great Falls, Mont.
Burnet-Binford Lumber Co., Inc., Indianapolis, Ind.
Byron Sash & Door Co., Inc., Louisville, Ky.
C-W Plywood Co., Chicago, Ill.
California Builders Supply Co., Oakland, Calif., and Sacramento, Calif.
California Door Co., The, Los Angeles, Calif.
California Panel & Veneer Co., Los Angeles, Calif.
Cameron Lumber Co., Inc., Newburgh, N. Y.
Camp Plywood Co., Inc., The E. W., Indianapolis, Ind., Louisville, Ky., and Cincinnati, Ohio.
Canadian Western Lumber Co., Ltd., Fraser Mills, B. C., Canada.
Cannon & Mullen, Salt Lake City, Utah.
Carr-Cullen Co., Minneapolis, Minn.
Casein Co. of America, Seattle, Wash.
Cavalier Corporation, Chattanooga, Tenn.
Cederquist Show Case & Cabinet Co., Los Angeles, Calif.
Central Building Supply Co., Inc., Baltimore, Md.
Central Laboratories, Inc., Memphis, Tenn.
Central Wholesale Co., Inc., Shreveport, La.
Chapin, Rollin C., Minneapolis, Minn.
Chapin Lumber Co., The, Aurora Branch, Denver, Colo.
Chapman Lumber Co., Portland, Oreg.
Charlottesville Lumber Co., Inc., Charlottesville, Va.
Chicago & Riverdale Lumber Co., Chicago, Ill.
Chicago Trim & Plywood Co., Chicago, Ill.
Christmann Veneer & Lumber Co., St. Louis, Mo.
Chrysler Corporation, Detroit, Mich.
Clark Veneer Co., Walter, Grand Rapids, Mich.
Cleverdon, Varney & Pike, Boston, Mass.
Cogswell Construction Co., The, Baltimore, Md.
Cole Manufacturing Co., Memphis, Tenn.
Columbia Valley Lumber Co., Bellingham, Wash.
Combs Lumber Co., Lexington, Ky.
Conemaugh Lumber Corporation, Johnstown, Pa.
Conrad & Cummings, Associated Architects, Binghamton, N. Y.
Coolbaugh & Sons Co., C. C., Gloucester City, N. J.
Coolerator Co., The, Duluth, Minn.
Cornwell Lumber Co., Saginaw, Mich.
Cram & Ferguson, Boston, Mass.
Crane Co., The Arthur D., Sparta, N. J.

- Cresmer Manufacturing Co., Riverside, Calif.
 Crompton & Knowles Loom Works, Worcester, Mass.
 Cross, Austin & Ireland Lumber Co., Brooklyn, N. Y.
 Crowell & Lancaster, Bangor, Maine.
 Curran Bros., Pomona, Calif.
 Curtis Co's., Inc., Clinton, Iowa.
 Curtis Co., Ros, Detroit, Mich.
 Curtiss-Wright, Airplane Division, Louisville, Ky.
 Darlington Veneer Co., Inc., Darlington, S. C.
 Davis Hardwood Co., San Francisco, Calif.
 Davis Plywood Corporation, The, Cleveland, Ohio, Columbus, Ohio, and Toledo, Ohio.
 Deacon Co., J. C., Chicago, Ill.
 De Jarnette, Charles W., Des Moines, Iowa.
 Denver Reserve Supply Co., Denver, Colo.
 Dix Lumber Co., N. Cambridge, Mass.
 Doddington Corporation, The, Columbus, Ohio.
 Donlin-Johnson Co., St. Cloud, Minn.
 Dougherty Lumber Co., The, Cleveland, Ohio.
 Dower Lumber Co., John, Tacoma, Wash.
 Downes Lumber Co., Boston, Mass.
 Durez Plastics & Chemicals, Inc., N. Tonawanda, N. Y.
 Edmonton Paint & Glass Co., Ltd., The, Edmonton, Alberta, Canada.
 Eiler Lumber Co., Edward, Pittsburgh, Pa.
 Elliott Bay Mill Co., Seattle, Wash.
 Elmer & Moody Co., Seattle, Wash.
 Empire Millwork Corporation, Corona, L. I., N. Y.
 Engineering & Research Corporation, Riverdale, Md.
 Epstein Co., N. B., Scranton, Pa.
 Evans & Callaway, Fowler, Ind.
 Evans-MacArthur Co., New York, N. Y.
 Evans Products Co., Coos Bay, Oreg.
 Exchange Lumber Co., Inc., Rochester, N. Y.
 Exchange Lumber & Manufacturing Co., Spokane, Wash.
 Farrar Lumber Co., Houston, Tex.
 Fayfield, Robert C., Buffalo, N. Y.
 Felter Lumber Co., George L., Philadelphia, Pa.
 Ferguson Bros. Manufacturing Co., Hoboken, N. J.
 Fessenden Hall, Philadelphia, Pa.
 Fink Schindler Co., The, San Francisco, Calif.
 Fischer Lime & Cement Co., Memphis, Tenn.
 Fitzpatrick Lumber Co., J. J., Madison, Wis.
 Flannagan, Eric G., Henderson, N. C.
 Flint Sash & Door Co., Inc., Flint, Mich.
 Florida, University of, School of Forestry, Gainesville, Fla.
 Foltz & Son, Herbert, Winter Haven, Fla.
 Forstom & Parks, Wichita, Kans.
 Forsberg-St. Clair Lumber Co., Kansas City, Mo.
 French Co., E. L., Detroit, Mich.
 Fry-Fulton Lumber Co., St. Louis, Mo.
 Fuller & Co., W. P., Butte, Mont., Portland, Oreg., and Seattle, Wash.
 Furer, Wm. C., Honolulu, Hawaii.
 Gaines, Henry Irvan, Asheville, N. C.
 Gaines Hardwood Lumber Co., St. Louis, Mo.
 Garratt & Co., Wayne, Pa.
 General Millwork Corporation, Utica, N. Y.
 Georgeson, F. T., Eureka, Calif.
 Georgia Hardwood Lumber Co., Augusta, Ga.
 Gibb, Office of Arthur N., Ithaca, N. Y.
 Gibbs Lumber Co., Anaheim, Calif.
 Gibson Door Co., The, Utica, N. Y.
 Girdler Corporation, The, Louisville, Ky. (General support.)
 Giusti & Co., S. A., San Francisco, Calif.
 Globe Wernicke Co., The, Norwood, Ohio.
 Godfrey Lumber Co., Boston, Mass.
 Grand Rapids Store Equipment Co., Grand Rapids, Mich.
 Grayling Lumber & Supply Co., Grayling, Mich.
 Greater New York Lumber Industries, Inc., New York, N. Y.
 Groffmann, Louis G., Louis, Mo. (General support)
 Guernsey-Westbrook Co., The, Hartford, Conn.
 Gulf States Plywood Co., Jacksonville, Fla., and New Orleans, La.
 Hagmeyer Lumber Co., Cincinnati, Ohio.
 Hahn, Stanley W., Silver Spring, Md.
 Haley Bros., Santa Monica, Calif.
 Hallack & Howard Lumber Co., The, Denver, Colo.
 Hambrick & Co., Rock Hill, S. C.
 Hammond Lumber Co., Los Angeles, Calif.
 Hannaford & Sons, Samuel, Cincinnati, Ohio.
 Haralson & Mott, Fort Smith, Ark.
 Harbor Plywood Corporation, Jacksonville, Fla., and Hoquiam, Wash.
 Harbor Plywood Corporation, Chicago Division, Chicago, Ill.
 Harbor Plywood Corporation of California, San Francisco, Calif.
 Harbor Sales Co., Inc., Baltimore, Md.
 Harrison-Martin Lumber Co., Grand Island, Nebr.
 Hartung Co., F. L., Seattle, Wash.
 Hasness, Carlisle D., Harrisburg, Pa.
 Hastings & Co., Inc., A. W., Somerville, Mass.
 Hawkins Lumber & Warehouse Co., Boston, Mass.
 Heacock & Platt, Philadelphia, Pa.
 Heidritter Lumber Corporation, Elizabeth, N. J.
 Helfensteller, Hirsch & Watson, St. Louis, Mo.
 Henrich Panel Co., Inc., Buffalo, N. Y.
 Henshaw & Ellwanger, Inc., Denver, Colo.
 Henshaw Refrigeration & Fixture Co., San Francisco, Calif.
 Higgins, Charles H., New York, N. Y.
 Hilgard Lumber Co., Chicago, Ill.
 Hill, Lyman, Hollywood, Calif.
 Hinkleley Lumber Co., The Dwight, Cincinnati, Ohio.
 Hirsch Lumber Co., New York, N. Y.
 Hodgdon & Son, Charles, San Gabriel, Calif.
 Hoffman Lumber Co., Pittsburgh, Pa.
 Holbrook Lumber Co., Springfield, Mass.
 Holsman & Holsman & Klekamp, Chicago, Ill.
 Hope, Frank L., Jr., San Diego, Calif.
 Horsley Co., Inc., The, New York, N. Y.
 Houston Sash & Door Co., Houston, Tex.
 Huber-Lancot Housewrecking Corporation, Buffalo, N. Y.
 Hudson-Houston Lumber Co., Ardmore, Okla.
 Hunter Lumber Co., Chillicothe, Ill.
 Hunting Lumber Co., R. D., Cedar Rapids, Iowa.
 Huss Lumber Co., Chicago, Ill.
 Huttig Sash & Door Co., Hughes Division, Louisville, Ky.
 Independent Lumber Co., The, Grand Junction, Colo.
 Indiana Lumber & Manufacturing Co., South Bend, Ind.
 Industrial Plastics Corporation, Milwaukee, Wis.
 Industrial Wholesale Lumber Co., Cleveland, Ohio.
 Interstate Sash & Door Co., The, Canton, Ohio.
 Iowa Builders Supply Co., Cedar Rapids, Iowa.
 Iron City Sash & Door Co., Pittsburgh, Pa.
 Ivey, Inc., Edwin J., Seattle, Wash.
 Jacksonville Sash & Door Co., Jacksonville, Fla.
 Johnson Lumber Co., Walter T., Omaha, Nebr.
 Johnson & Lundgren, Tacoma, Wash.
 Johnson Wallwork & Dukehart, Portland, Oreg.
 Kaelber & Waasdrop, Rochester, N. Y.
 Keely Plywood Co., Hal, Pittsburgh, Pa.
 Keich & O'Brien, Warren, Ohio.
 Kellogg & Sons Co., Charles C., Utica, N. Y.
 Kennedy Lumber & Coal Co., Trenton, N. J.
 Killefer Manufacturing Corporation, Los Angeles, Calif.
 Kimball Lumber Co., Watertown, Mass.
 Knauth, Halligan & McLellan, Inc., New York, N. Y.
 Kneeland Bigelow Distributing Co., Bay City, Mich.
 Koch Butchers' Supply Co., The, N. Kansas City, Mo.
 Kraus Bros. Lumber Co., of Fla., Tampa, Fla.
 Laucks, Inc., I. F., Seattle, Wash.
 Law, Law, Potter & Nystrom, Madison, Wis.
 Lee, W. H., Philadelphia, Pa.
 Levy, Will, St. Louis, Mo.
 Lewis Lumber Co., Spring Lake, N. J.
 Liggett Drug Co., Inc., Boston, Mass.
 Little, W. A., Washington, Pa.
 Loeb, Laurence M., White Plains, N. Y.
 Loetcher & Burch Manufacturing Co., Des Moines, Iowa.
 Loftus, Peter F., Pittsburgh, Pa.
 Long Fir Gutter Co., Cadiz, Ohio.
 Lookout Lumber Co., Chattanooga, Tenn.
 Lord & Bushnell Co., The, Chicago, Ill.
 Lumber & Millwork Co. of Philadelphia, The, Philadelphia, Pa.
 Lumber Supply & Warehouse Co., Seattle, Wash.
 Lumberman's Supply, Inc., Sacramento, Calif.
 Lumbermens Associated Buyers Co., Des Moines, Iowa.

- Lyon-Gray Lumber Co., Dallas, Tex.
 Lyman-Hawkins Lumber Co., Akron, Ohio.
 Lyon Metal Products, Inc., Aurora, Ill.
 M & M Plywood Corporation (Division of M & M Wood Working Co.), Longview, Wash.
 MacDonald & Harrington, Ltd., San Francisco, Calif.
 Maclea Lumber Co., The, Baltimore, Md.
 Maguire & Associates, Charles A., Providence, R. I.
 Mann & Co., Hutchinson, Kans.
 Markland Contracting Co., M. B., Atlantic City, N. J.
 Marshall-Wright Lumber Co., Inc., Ionia, Mich.
 Marvin Millwork, Inc., Ellenville, N. Y.
 Mason & Co., George D., Detroit, Mich.
 Matot, Inc., D. A., Chicago, Ill.
 Matthews Hardwoods, Inc., Seattle, Wash.
 Mauk Seattle Lumber Co., Seattle, Wash.
 McCray Refrigerator Co., Kendallville, Ind.
 McCulloch, E. Russell, Atlanta, Ga.
 McFarland Lumber Co. of Philadelphia, Philadelphia, Pa.
 McGuinn Lumber Co., N. J., Charlotte, N. C.
 McPhillips Manufacturing Co., Mobile, Ala.
 Mechanics Lumber Co., Inc., New York, N. Y.
 Memphis Sash & Door Co., Memphis, Tenn.
 Merrill-Schaaf Lumber Co., Pierre, S. Dak.
 Merritt Lumber Yards, Inc., Reading, Pa.
 Michigan Wholesalers, Inc., Ft. Wayne, Ind., and Toledo, Ohio.
 Mid-West Lumber Co., The, Mankato, Kans.
 Miller & Yeager, Terre Haute, Ind.
 Milwaukee Plywood Co., Milwaukee, Wis.
 Minot Builders Supply Co., Minot, S. Dak.
 Mixer & Co., Buffalo, N. Y., and Schenectady, N. Y.
 Montague Co., The, San Francisco, Calif.
 Montgomery Co., J. B., Pittsburgh, Pa.
 Moore & Co., Dallas, Tex.
 Moore & Co., Le Mars, Iowa.
 Moore Lumber Co., L. A., Mason City, Iowa.
 Mooser, William, San Francisco, Calif.
 Morgan Sash & Door Co., Oklahoma City, Okla.
 Mowry & Co., Inc., Geo., Derry, Pa.
 Mueller, Hair & Hettrich, Hamilton, Ohio.
 Muehlenberg Bros., Reading, Pa.
 Nash, Robinson & Co., Waco, Tex.
 National Plywood Co., Inc., New York, N. Y.
 National Plywoods, Inc., Chicago, Ill.
 Neal-Blun Co., Savannah, Ga.
 New Orleans, Inc., Better Business Bureau of, New Orleans, La. (General support.)
 New York State College of Forestry, Department of Forest Utilization, Syracuse, N. Y. (General support.)
 Nicolai Door Sales Co., San Francisco, Calif.
 Northrup & O'Brien, Winston Salem, N. C.
 Northwest Door Co., Tacoma, Wash.
 Norton & Son, F. S., Algona, Iowa.
 Nurenborg, W. S., Ft. Worth, Tex.
 O & N Lumber Co., Menomonee, Wis.
 Oakland Public Schools, Oakland, Calif.
 Officer, Gwynn, Berkeley, Calif.
 Ohio City Sash & Door Co., Dayton, Ohio.
 Ohio Dealers Wallboard Co., Cleveland, Ohio.
 Ohio State University, Columbus, Ohio. (General support.)
 Olympic Manufacturing Corporation, Gresham, Ore.
 Olympic Plywood Co., Shelton, Wash.
 Omaha Hardwood Lumber Co., Sioux City, Iowa.
 Oregon Plywood Corporation, Sweet Home, Ore.
 Oregon-Washington Plywood Co., Tacoma, Wash.
 Pacific Mutual Door Co., Los Angeles, Calif., and Chicago, Ill.
 Packard Motor Car Co., Detroit, Mich.
 Parselsky Bros., Inc., Brooklyn, N. Y.
 Patten-Blinn Lumber Co., Los Angeles, Calif.
 Pease Woodwork Co., Inc., Cincinnati, Ohio.
 Peerless Built-In Fixture Co., Berkeley, Calif.
 Pehrson, G. A., Spokane, Wash.
 Pennsylvania Lumberman, Scranton, Pa.
 Pennsylvania State College, The, Department of Forestry, State College, Pa. (General support.)
 Pepper, George W., Jr., Philadelphia, Pa.
 Perlin Lumber Co., Brooklyn, N. Y.
 Philco Corporation, Philadelphia, Pa.
 Picket, Hyde & Langgans Co., Johnstown, Pa.
 Platt & Bro., F. P., New York, N. Y.
 Plylock Corporation (Division of M & M Wood Working Co.), Portland, Ore.
 Plywood Dayton Co., Dayton, Ohio.
 Plywood Detroit Co., Detroit, Mich.
 Plywood Distributing Co., Chicago, Ill.
 Plywood & Lumber Service, Baltimore, Md.
 Plywood Products Corporation, New York, N. Y.
 Plywoods-Plastics Corporation, Hampton, S. C.
 Procter & Bowie Co., Waterville, Maine.
 Proudfit Prestegaard Lumber Co., (R. S. Proudfit Co.), Lincoln, Nebr.
 Puget Sound Plywood, Inc., Kansas City, Mo., and Tacoma, Wash.
 Queensborough Lumber Co., Inc., Bayside, N. Y.
 Quigley Co., J. R., Gloucester City, N. J.
 Radford Co., The, Oshkosh, Wis.
 Rae Building Materials, Toledo, Ohio.
 Ramsey & Sons, Inc., A. H., Miami, Fla.
 Rafter, J. T., Jr., Houston, Tex.
 Reid, William H., Jr., Billings, Mont.
 Rhodes, Harry A., Rensselaer, N. Y. (General support.)
 Ritchie & Associates, James H., Boston, Mass.
 Robert & Co., Inc., Atlanta, Ga.
 Robinson Manufacturing Co., Everett, Wash.
 Rockwell Bros. & Co., Houston, Tex.
 Roddis Co., Chicago, Ill.
 Roddis Lumber & Veneer Co., Milwaukee, Wis.
 Roddis Lumber & Veneer Co. of Missouri, Kansas City, Mo.
 Roddis Panel & Door Co., Cincinnati, Ohio.
 Roddis Plywood & Door Co., Inc., New York, N. Y.
 Rogers Lumber Co., The T. H., Oklahoma City Okla.
 Rohrer Lumber Co., D. J., Clintonville, Wis.
 Rounds & Porter Co., Wichita, Kans.
 Rudinger, Inc., C. R., S. Kearny, N. J.
 Rugles Lumber Co., Carlos, Springfield, Mass.
 Ruse & Co., Baltimore, Md.
 St. Louis, City of, Board of Education, St. Louis, Mo.
 St. Paul & Tacoma Lumber Co., Tacoma, Wash.
 Schroeder Sales Co., Houston, Tex.
 Sears, Roebuck & Co., Chicago, Ill.
 Segelke & Kohlhaus Co., La Crosse, Wis.
 Shaver, Chas. W., Salina, Kans.
 Sheboygan Fruit Box Co., Sheboygan, Wis.
 Shenk Co., Henry, Erie, Pa.
 Shepard & Morse Lumber Co., New York, N. Y.
 Sholar Lumber Co., H. W., Lenoir, N. C.
 Shreiner Lumber Co., E. H., Pittsburgh, Pa.
 Simons, Inc., Minneapolis, Minn.
 Simons Lumber Co., Henry, Minneapolis, Minn.
 Simpson Industries, Inc., Seattle, Wash.
 Simpson Logging Co., Plywood & Door Division, McCleary, Wash.
 Skyline Lumber Co., Inc., Roanoke, Va.
 Sleeper, Harold R., New York, N. Y.
 Sloan Lumber Co., Ft. Worth, Tex.
 Smith Lumber Co., Earl V., Salt Lake City, Utah.
 Smith-Orr Co., Dearborn, Mich.
 Smith Wood-Products, Inc., Portland, Ore.
 Snell Sash & Door Co., St. Paul, Minn.
 Sothman Co., The, Grand Island, Nebr.
 South Side Lumber & Supply, Toledo, Ohio.
 Southland Lumber & Trading Co., Inc., New Orleans, La.
 Southwestern Sash & Door Co., El Paso, Tex.
 Special Materials, Oakland, Calif.
 Specification Record, Chicago, Ill.
 Spokane Sash & Door Co., Spokane, Wash.
 Standard Cabinet Works, Inc., Los Angeles, Calif.
 Standard Lumber Co., Pine Bluff, Ark.
 Standard Lumber Co., Spokane, Wash.
 Standard Lumber & Supply Co., Ft. Wayne, Ind.
 Stanton & Son, Inc., E. J., Los Angeles, Calif.
 Stark & Co., Kansas City, Mo.
 Steele & Hibbard Lumber Co., St. Louis, Mo.
 Stiles Lumber & Veneer Co., Grand Rapids, Mich.
 Stoetzel, Ralph E., Chicago, Ill.
 Stouck-Reaser Co., Inc., Gettysburg, Pa.
 Strable Hardwood Co., Oakland, Calif.
 Strong & Hale Lumber Co., The, Portland, Conn.
 Summers Lumber & Supply Corporation, Bay Shore, N. Y.
 Sutliff Co., Milan R., Oshkosh, Wis.
 Swan Lake Moulding Co., Klamath Falls, Ore.
 Sweet's Catalog Service, New York, N. Y. (General support.)
 Syracuse University, Syracuse, N. Y.
 Taylor, John, Catonsville, Baltimore, Md.

- Taylor, Edw. Cray & Ellis Wing, Los Angeles, Calif.
 Teachout Sash, Door & Glass Co., Detroit, Mich.
 Texas Technological College, Department of Architecture & Allied Arts, Lubbock, Tex. (General support.)
 Thayer Portable House Co., Keene, N. H.
 Thomas, Arthur E., Dallas, Tex.
 Thompson & Lichtner Co., Inc., The, Boston, Mass.
 Thorne, Henry Calder, Ithaca, N. Y.
 Throop-Martin Co., The, Columbus, Ohio.
 Toombs & Co., Springfield, Mo.
 Trexler Lumber Co., Allentown, Pa.
 Trojan Cupboard Co., Burbank, Calif.
 Tulane Hardwood Lumber Co., Inc., New Orleans, La.
 Turgeon, Henry W., Lewiston, Maine.
 Turner Lumber Co., J. C., Irvington, N. Y.
 Underwood Veneer Co., Wausau, Wis.
 United Chemical & Organic Products (Division of Wilson & Co., Inc.), Chicago, Ill. (General support.)
 United Sash & Door Co., Wichita, Kans.
 United States Plywood Corporation, New York, N. Y.
 Valverde Co., Scranton, Pa.
 Vancouver Plywood & Veneer Co., Vancouver, Wash.
 Vaughan & Sons, Geo. C., Houston, Tex.
 Virginia Polytechnic Institute, Blacksburg, Va.
 Von Tobel Lumber Co., Ed, Los Vegas, Nev.
 Voorhees, Walker, Foley & Smith, New York, N. Y.
 Walton Plywood Co., Everett, Wash.
 Wanke Panel Co., Portland, Oreg.
 Waples-Painter Co., Gainesville, Tex.
 Ware & McClenahan, Salt Lake City, Utah.
 Warren Brothers Co., Nashville, Tenn.
 Washington Veneer Co., Ft. Worth, Tex., and Olympia, Wash.
 Washington Woodworking Co., Inc., Washington, D. C.
 Watertown Sash & Door Co., Watertown, S. Dak.
 Weber Veneer & Plywood Co., Shawano, Wis.
 Weimer & Sons, George, St. Albans, W. Va.
 Weinell Lumber Co., A. F., Columbia, Ill.
 Welch, Carroll E., Huntington, N. Y.
 West, Albert E., Boston, Mass.
 West Coast Plywood Co., Aberdeen, Wash.
 Western Door & Sash Co., Oakland, Calif.
 Western Electric Co., Inc., New York, N. Y.
 Western Hardwood Lumber Co., Los Angeles, Calif.
 Western Woodworking Co., Bellingham, Wash.
 Weyerhaeuser Sales Co., Tacoma, Wash.
 Wheeler, Osgood Co., The, Tacoma, Wash.
 Wheelock, Inc., E. U., Los Angeles, Calif.
 Whissel Lumber Co., Inc., L. N., Buffalo, N. Y.
 White Brothers, San Francisco, Calif.
 Whittier Lumber & Millwork Co., Newark, N. J.
 Wholesale Building Supply Inc., Oakland, Calif.
 Wholesale Distributing Co., Pittsburgh, Pa.
 Wickes Engineering & Construction Co., Camden, N. J.
 Wight & Wight, Kansas City, Mo.
 Wilbur Lumber Co., West Allis, Wis.
 Wiles-Chipman Lumber Co., St. Louis, Mo.
 Willatsen, Andrew, Seattle, Wash.
 Williams & Hunting Co., Cedar Rapids, Iowa.
 Winde, McCormick & Chapin, Inc., Charlestown, Mass.
 Wisconsin's Transfer Yard, Oshkosh, Wis.
 Woltersdorf, Arthur, Chicago, Ill. (General support.)
 Wolverine Shingle & Lumber Co., Detroit, Mich.
 Wood Lumber Co., Birmingham, Ala.
 Wood Lumber Co., E. K., Los Angeles, Calif., and Oakland, Calif.
 Woodcraft Corporation, The, Bay City, Mich.
 Wright & Wright, Detroit, Mich. (General support.)
 Young & Richardson, Seattle, Wash.
 Zimmerman, A. C., Pasadena, Calif.
 Zimmerman Lumber Co., Inc., Buffalo, N. Y.

U. S. GOVERNMENT

- Agriculture, U. S. Department of, Farm Security Administration, Washington, D. C.
 Agriculture, U. S. Department of, Forest Service, Washington, D. C.
 Commerce, U. S. Department of, Bureau of the Census, Washington, D. C. (General support.)
 Federal Housing Administration, Washington, D. C. (General support.)
 Federal Works Agency, Public Buildings Administration, Washington, D. C. (General support.)
 National Housing Agency, Washington, D. C.
 Naval Training Center, Great Lakes, Ill.
 Navy Department, Coast Guard, Washington, D. C.
 Navy Yard, Lumber Office, Stovehouse Division, Brooklyn, N. Y.
 Navy Yard, Public Works Department, Philadelphia, Pa.
 Navy Yard, Public Works, Portsmouth, N. H.
 War Production Board, Washington, D. C. (General support.)