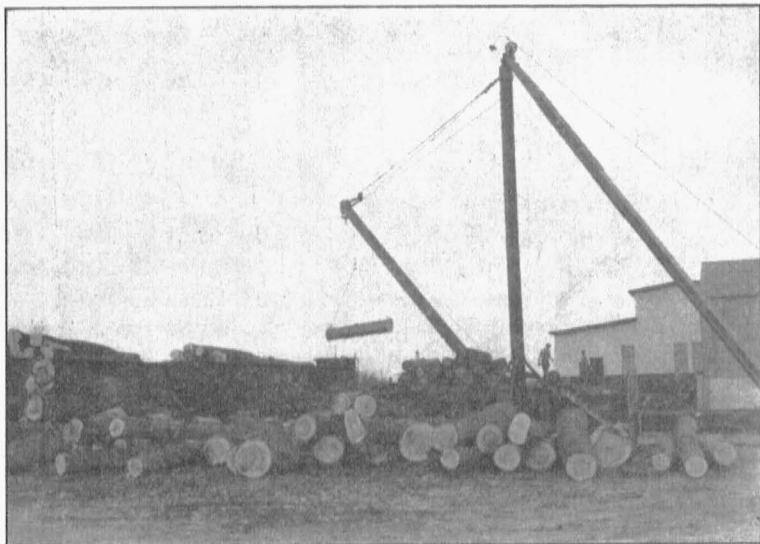


UNIVERSITY OF MISSOURI COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION

M. F. MILLER, *Director*

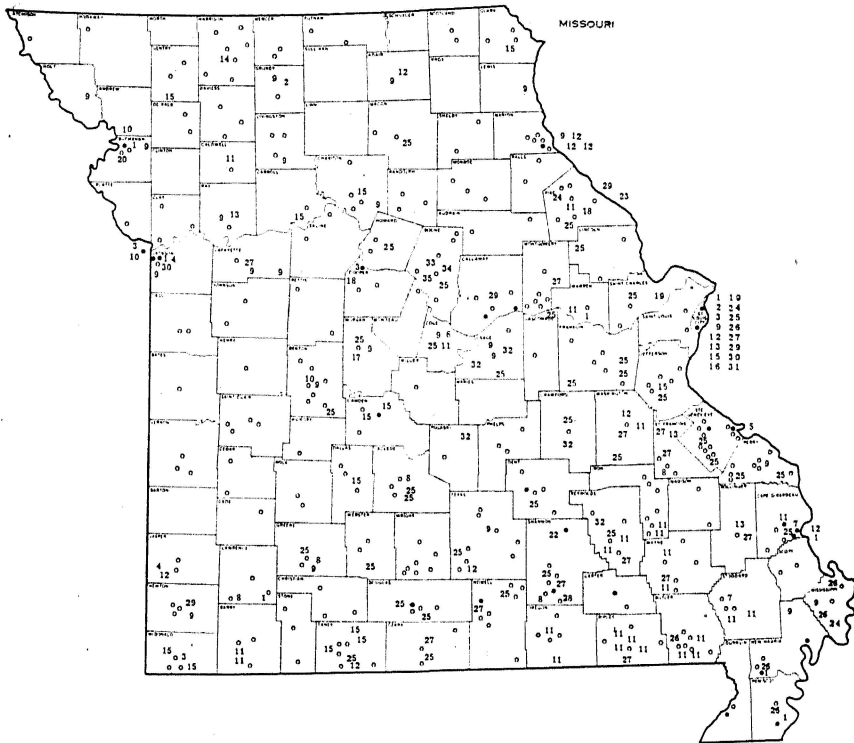
Missouri Woods and Wood-Using Industries

WM. C. SECHRIST and RALPH H. PECK



This crate veneer plant uses 1,500,000 board feet of Missouri logs annually.

COLUMBIA, MISSOURI



Map of Missouri Showing Location of the More Important Wood-Using Industries Contacted During the Wood-Using Industry Survey, 1940-41.

Legend

- Sawmills (over 500,000 bd. ft. annually)
- Sawmills (small)

- | | |
|-----------------------------------|---|
| 1. Boxes and crates | 18. Pipes—smoking |
| 2. Caskets | 19. Pulpwood (paper) |
| 3. Commission | 20. Saddle stirrups |
| 4. Creosoting plants | 21. Sawmills (see symbols) |
| 5. Crutches and canes | 22. Shingles (wood) |
| 6. Decoy ducks | 23. Shredded wood |
| 7. Farm Implements (wood parts) | 24. Small dimension stock |
| 8. Oak flooring | 25. Stave mills (tight) |
| 9. Furniture (all kinds) | 26. Stave mills (slack) |
| 10. Gun stocks and blanks | 27. R. R. tie yards (only few shown. Yard in most every county) |
| 11. Tool handles and blanks | 28. Wagon hubs |
| 12. Millwork (sash, doors) | 29. Veneer (box and basket) |
| 13. Mine timbers | 30. Veneer (furniture) |
| 14. Mouse traps | 31. Wood fiber |
| 15. Novelties | 32. Wood distillation (charcoal) |
| 16. Pencils | 33. 34, 35. Airplane propellers, skis, archery bows. |
| 17. Pins and brackets (telephone) | |

Missouri Woods and Wood-Using Industries

WM. C. SECHRIST AND RALPH H. PECK

The information and data, upon which this report is based, was collected during 1940 and 1941, in a survey of wood-using industries in Missouri carried on by the Missouri Agricultural Experiment Station with the active cooperation and financial support of the Missouri Conservation Commission.

Previous information of this type has not been available since results of an early study of the wood-using industries of the state, carried on by the U. S. Forest Service, were published in the March 15, 1912, number of the St. Louis Lumberman.

Missouri, with more than one-third of her land surface in forest cover, imports from other states roughly 80 per cent of the lumber used within the state. Until recently the cutting of Missouri timber has been at a rate in excess of the growth. Now, however, due to increasing amounts of southern and western lumber used, it is highly probable that the cut of native-grown timber is less than the annual growth. The loss to Missouri is apparent in two direct ways; first, as a loss to landowners who are unable to market their timber crops profitably because of shut down of local industries, and second, a loss to forest communities of opportunities for wages and employment in those industries.

Although Missouri uses five times as much lumber as is produced within the state, farmers and other small forest owners often are unable to dispose of home grown forest products profitably owing to lack of information as to location of markets, species and specifications in demand, and prices available. The purpose of this survey is to provide marketing information to timber producers and to determine location of areas where present supplies of raw materials would appear to warrant establishment of new industries.

The survey was carried on by making personal visits to all wood-using industries, including all sawmills which could be located. Information was obtained from a total of 449 industries, including 150 sawmills and 38 stave mills.

Mimeographed forms were filled out for each individual industry giving complete information as to source and character of materials purchased, products sold, and local economic significance. Specimen forms are appended to this report.

Volumes of lumber or other forest products, shown as being used by the various industries or groups of industries, apply only to that grown in Missouri. To simplify a summary of Missouri grown products, volumes shown in cords have been converted to board feet. Converting factors of 550 board feet per standard cord for bolts averaging 8 inches and over in diameter and 500 board feet for bolts averaging less than 8 inches in diameter were used.

Industries have been classified into 35 groups based on products manufactured. Plants producing more than one product are listed in the directory under each of the groups which they represent. Twenty of these groups use over 90 per cent Missouri wood, while six use very little or none.

Brief descriptions of the importance of the various groups of industries to Missouri wood consumption follow. All figures showing volumes of wood used, or products manufactured, refer to the calendar year 1940.

Uses of Missouri Timber

Ties—Railroad.—Tie production leads all wood uses with an annual output of 1,100,000 ties, approximating 40,000,000 bd. ft. of lumber. Roughly 90 per cent of the total output is handled by seven large companies which buy ties, delivered to central yards located at railroad



The largest users of Missouri timber are the railroads, using 40,000,000 board feet annually.

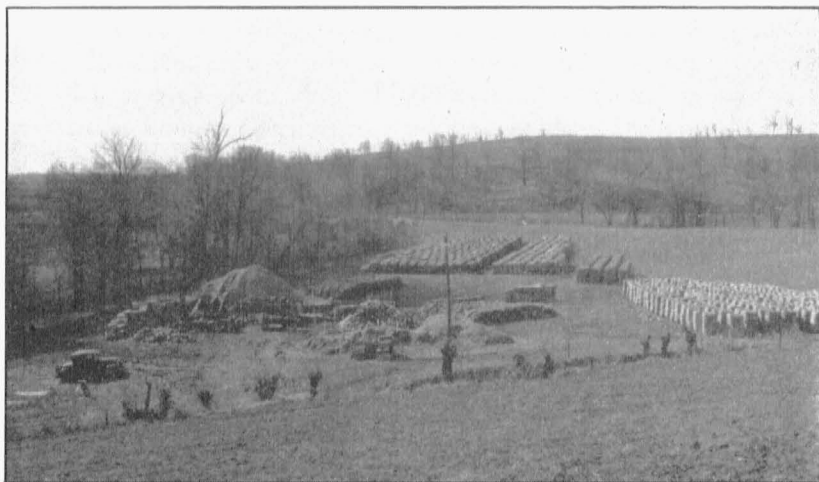
points throughout the state. Some companies also operate sawmills and buy logs and standing timber from which they saw both ties and

lumber. Most of the side material slabbed off in squaring ties is sold to flooring manufacturers in Missouri and Tennessee. Approximately 98 per cent of the ties produced in Missouri are of oak species. Practically all of the ties produced from black oak species, or roughly 60 per cent, are creosoted before using.

Cooperage Industry.—The cooperage industry, including stave mills making tight and slack staves and barrel assembly plants, ranks second in the amount of Missouri wood used, requiring about 34,000,000 bd. ft.

a. Stave mills making bourbon and oil barrel staves produced about 15,000,000 staves using approximately 21,000,000 bd. ft. of best grade white and bur oak. The material used is bought as stumpage or in bolt form at the mill. The production of staves has increased rapidly during the past few months. At present some post oak is being used for bourbon staves and some of the black oak species for oil staves. At least 95% of the wood used is grown in the state.

b. The 5 mills producing slack staves, all located in the southeastern part of the state, produce about 35,000,000 staves using about 35,000 ranks of bolts or 13,000,000 bd. ft. Elm, sycamore, hackberry, soft maple, poplar, cottonwood, gum, and birch are used, all of which is grown in the state.



Stave Mill. This is one of the leading wood-using industries in Missouri, using 21,000,000 board feet of best grade white and bur oak annually.

c. Four plants, two making tight and two slack cooperage, produce the majority of the barrels in the state. Practically all of the tight staves used and the majority of the slack staves are produced in the state.

Boxes and Crates.—The manufacture of boxes and crates ranks third in the amount of wood used, requiring about 25,000,000 bd. ft. This does not include veneer containers. A total of eleven plants were reported while many others, making crates and boxes for their own use, are not included. Important species used are cottonwood, pine, oak and cypress. About 75% of the material used is grown in the state and purchased in the form of standing timber, logs, lumber, and occasionally slabs and edgings.

Flooring.—The 5 flooring mills produce 18,500,000 bd. ft. of oak flooring, using 20,000,000 bd. ft. of rough lumber. Four of these plants buy lumber and in addition some have sawmills and buy stumpage and logs.

Handles, Tool.—The 5,700,000 tool handles made in the state require 14,000 cords or 7,700,000 bd. ft. Hickory is the principal species used by the 22 plants contacted. One plant uses a small amount of white oak, maple, and ash and another, making farm tool handles, uses only ash. Practically all of the material used is grown in the state and purchased in the form of bolts delivered at the mill. One large plant using all out-of-state wood is not included in the report.

Charcoal.—The burning of charcoal by three companies at five plants uses about 12,500 cords or 6,250,000 bd. ft. of oak wood and produces approximately 5,000 tons of charcoal. All wood used is grown in the state and practically all is bought by the cord at the plants. The production of charcoal has increased during 1941 and 1942.

Veneer, Basket.—About 2,500,000 bd. ft. of logs are used by the three plants making veneer for berry, bushel, and grape baskets, and egg crates. The logs and bolts are purchased at the mill. Cottonwood, sycamore, elm, and soft maple, all cut in the state, are the principal species used.

Veneer, Furniture.—Two plants produce practically all of the furniture veneer using walnut, tulip poplar, maple, and gum. About half of the logs used are from out-of-state.

Mine Props.—Over 500,000 oak mine props are shipped out of state. Most of these are handled by R. R. tie companies. Local mines, which use any available species, no doubt use as many as are shipped out of the state.

Small Dimension Stock.—Mills producing small dimension stock for furniture use about 750,000 bd. ft. About 75% of all wood used is grown in the state. The three plants use walnut, gum, oak, and cottonwood purchased in the form of logs, bolts, and lumber.

Furniture.—Furniture plants of all types use about 725,000 bd. ft. (not including veneer) of walnut, oak, and sycamore. Other species

are used to a limited extent. About 36 plants were contacted. Only 20% of the wood used is grown in Missouri.

Gun Stocks.—The majority of the 350,000 gun stocks and blanks are produced by three plants. Since all but one of the plants also produce other products the exact amount of wood used for stocks alone can only be estimated at about 700,000 bd. ft. Walnut is the only species used. About 75% of all used is grown in the state.

Pins and Brackets, Telephone.—One factory makes telephone pins and brackets using about 800 cords or 440,000 bd. ft. of oak bolts. All wood used is grown in the state and purchased in bolt form at the mill.

Pulpwood.—Approximately 500 units (4'x5'x8') of pulpwood or 310,000 bd. ft. are produced in the eastern part of the state. All pulpwood is handled by one agent who buys stumpage or peeled bolts. Soft maple, willow, box elder, and cottonwood are the only species used.

Shredded Wood.—Shredded wood, used for packing trees, is made by one individual on a home made shredder. About 300 cords or 150,000 bd. ft. of cottonwood, soft maple, elm, and willow are used. All wood used is grown in the state and purchased in bolt form at the mill.

Saddle Stirrups.—The only wood saddle stirrup factory in the U. S. is located in the northwestern part of the state. About 150 cords or 82,500 bd. ft. of ash, hickory, pecan, hackberry, and elm are used. All wood used is grown in the state. Stirrups from this factory were shipped to nearly every country in the world before the war.

Cottonwood Fiber.—Cottonwood fiber, which is used in high grade plaster, is made by one plant using about 100,000 bd. ft. of cottonwood logs. About half of the wood used is grown in the state.

Farm Implement Parts.—Wooden parts for farm implements such as wagon parts, neck yokes, single trees, etc., use about 100,000 bd. ft. Hickory is the principal species used although white oak is used to a limited extent. Material, all grown in the state, is purchased in the form of logs or bolts at the mill. The three plants producing these also make other products such as handles and furniture parts.

Novelties.—The 12 novelty plants contacted use about 50,000 bd. ft. of walnut, oak, cherry, maple, cedar, and ash, all grown in Missouri. Most of these plants are small and only a few operate throughout the year. The material used is bought as stumpage, logs, bolts, and lumber.

Pipes, Smoking.—Two plants make hickory smoking pipes, using about 100 cords of hickory poles which are purchased by the piece at the factory. All wood used is grown in the state.

Wagon Hubs.—One plant makes wagon hubs using about 25 cords of white oak. All material used is grown in the state and bought as stumpage and bolts.

Creosoting Plants.—There are four creosoting plants, two large plants using the pressure method and two, operating in conjunction with other plants, which use the hot and cold bath method. The small plants creosote only pine posts.

Caskets.—Several casket factories are located in the larger cities and a few wood-working shops throughout the state in isolated areas make caskets as a sideline. Walnut and cypress are the principal species used.

Shingles.—One small mill uses yellow pine for making shingles for home use and local sale.

Millwork.—The 10 mill-working shops contacted use mostly out-of-state wood.

Commission.—Commission houses dealing in wood and lumber are located in the larger cities and handle mostly out-of-state products.

The following plants use all out-of-state wood:

Crutches and Canes.—The only crutch and cane factory west of the Mississippi River is located in southeast Missouri. This plant uses maple and a very small amount of rosewood.

Decoy Ducks.—One woodworking shop makes decoy ducks.

Skis.—One plant makes skis, using hickory from the South.

Pencils.—One large pencil factory uses western red cedar exclusively. Several years ago it used native red cedar.

Mouse Traps.—One plant makes mouse traps using only plywood.

The following summary gives the volume of wood cut and used or manufactured beyond the log stage in the state.

	bd. ft.
1. Lumber for general use, construction farm use, etc.	25,000,000
2. Lumber used for manufacture of flooring, boxes, crates, furniture, novelties, etc.	47,000,000
3. R. R. ties, sawed and hewn, using 36 bd. ft. per tie	40,000,000
4. Logs and bolts above 8" in diameter. Handle stock, slack and tight cooperage, veneer logs, etc.	43,300,000
5. Bolts below sawlog size used for making charcoal, pulp- wood, mine props, shredded wood, etc.	10,375,000
Total	166,175,000

Fuelwood which would come under this classification is not included in the above figures. There are approximately 250,000 farms

TABLE LISTING THE MORE IMPORTANT FOREST PRODUCTS, SPECIES USED, UNIT USED FOR SALE, AMOUNT USED PER YEAR, VOLUME OF FINISHED PRODUCT. STUMPAGE PRICE, AND PRICE F.O.B. MILL IN THE FORM SHOWN UNDER THE LAST COLUMN

Product	Species	Unit	Amount Used	Volume Mfg.	Stumpage Price	Price f. o. b. Mill	Form
R. R. Ties	Oak	Piece	40,000,000 bd. ft.	1,100,000 Ties	.10-.25	.35-.90	Tie
Boxes, Crates	Pine, Oak, Cypress, Cottonwood	Bd. ft.	25,000,000 bd. ft.	.....	....	10.00-14.00 logs	Logs, Lumber
Flooring	Oak	Bd. ft.	20,000,000 bd. ft.	18,500,000	1.50-3.50	17.00-26.00 logs	Logs, Lumber
Furniture	Oak, Walnut, Sycamore	Bd. ft.	750,000 bd. ft.	.....	....	.....	Lumber
Small Dimension	Walnut, Oak, Gum, Cottonwood	Bd. ft., Cord	750,000 bd. ft.	.....	....	20.00-50.00 M. 4.00-10.00 cord	Bolt, Log
Gun Stocks	Walnut	Bd. ft.	700,000 bd. ft.	350,000	....	30.00-70.00	Logs
Farm Implement Parts	Hickory, White Oak	Bd. ft., Log	65,000 bd. ft.	.....	....	18.00-20.00 log, 8.00 cord	Log, Bolt
Novelties	Maple, Cedar, Oak, Walnut, Cherry	Bd. ft.	50,000 bd. ft.	.....	....	.....	Lumber, Logs
Barrel Staves	White and Bur Oak	Chord ft.	50,000 cords	15-18,000,000	.05-.15	Oil—.09-.18, Bourbon .18-.32	Bolt
Barrel Staves (slack)	Sycamore, Elm, Cottonwood, Gum	Rank (4'x32"x8')	35,000 cords	35,000,000	....	3.40-5.25	Bolt
Handles—Tool	Hickory (95%), Ash, W. Oak	Rank, Cord	14,000 cords	5,700,000	1.50-2.25	7.25-10.00	Bolt
Veneer—Basket, Crate	Cottonwood, Elm, Sycamore	Bd. ft.	2,000,000 cords	.....	....	16.00-20.00	Log
Veneer—Furniture	Gum, Poplar, Walnut	Bd. ft.	2,500,000 cords	.....	15-.50.00	40.00-100.00	Log
Mine Timbers—Props	Oak (any for local mines)	Piece, Short Cord	500-600,000 pc.	.....	....	2.50-3.00 cord, .025-.06 piece	Prop
Mine Timbers—Ties	Oak	Piece	.....	.....	....	.06-.07 piece	Tie
Charcoal	Any Hardwood	Cord	12,500 cords	5,000 Tons	....	1.75-2.00	Bolt
Pulpwood	Soft Maple, Box Elder, Willow, Cottonwood	Long Cord (4x5x8)	500 cords	.....	.50	6.00 f. o. b. R. R.	Bolt
Pipes—Smoking	Hickory (poles 4')	Piece	100 cords	580,000	....	.01 per 4' pole	Pole
Fence Posts	Cedar	Piece	.....	.....	.01-.025	.05-.07 (.10-.17 retail)	Post
Sawdust	White and Bur Oak	Ton	5,000 tons	.....	....	.25 (at stave mill)	Ton

in Missouri. Using a very conservative figure of 4 cords per farm, this would amount to an annual consumption of 1,000,000 cords of fuel-wood. Using 300 bd. ft. per cord, as a converting factor this use alone would consume 300,000,000 bd. ft.

Fence posts also are not included in the above figures. Soil Conservation Service surveys show that about 100 posts are used annually on each farm. Using a figure of 50 per farm, 7,500,000 posts or 22,500,000 bd. ft. are used annually. Including cedar posts shipped out of the state this use of wood alone consumes 35,000,000 bd. ft.

Commercial Timber Species and Their Uses

The more important timber species in Missouri and the uses made of each are outlined below. Practically all species shown are also used for general farm construction and fuel.

Ash.—Although the supply of this wood is limited, it finds a ready market for farm and striking tool handles. The best grade saddle stirrups are made from ash. A small amount is cut into lumber, which brings a good price. Oil grade barrel staves and novelties consume a small amount.

Box Elder.—Same uses as red and silver maple.

Cedar.—By far the largest amount of this species is used for fence posts. Trees of sawlog size are sawed into lumber for use in making furniture, chests, and novelties.

Cherry.—Cherry is found only in limited quantities, usually along fence rows, and is used for furniture and novelties.

Cottonwood.—Cottonwood is one of the more important species and has a great variety of uses. The lumber is used for general construction, boxes, and crates, and for bracing and protection when shipping brick by rail. Timbers and planks are used as spacers for shipping large iron products. A small amount is used for railroad ties for temporary track. Logs and bolts are used for veneer for baskets and crates, slack cooperage, pulp wood, shredded wood and wood fiber.

Cypress.—A limited amount of this species is found in the southeastern part of the state. This is used for general construction, posts, poles, caskets, boxes, and crates.

Elm.—Elm is used for veneer for baskets and crates, saddle stirrups, slack cooperage, and lumber for home use.

Gum, Red.—This species is restricted in its range and merchantable quantities. It is used for veneer, slack cooperage, small dimension stock, and novelties.

Hackberry.—Same uses as elm.

Hickory.—Practically all the hickory used is for tool handles.

A small amount is used for making skis, saddle stirrups, and farm implement parts. Hickory poles 1"-3" diameter are used for making smoking pipes. In some sections of the Ozark Region hickory is used for weaving baskets. It is important also as a commercial fuel wood.

Maple, Red and Silver.—Shredded wood, pulpwood, furniture, and basket and crate veneer.

Maple, Sugar.—Most sugar maple in the state has dark streaks through the wood which makes it unsuitable for high grade furniture or other special uses. Used to some extent for tool, brush, and broom handles, novelties, and wood heels. Sawdust from wood heel plants is used in the manufacture of certain types of brick.

Oaks, Black.—The black oaks are used extensively for lumber, flooring, furniture, railroad ties, mine timbers, telephone pins and brackets, charcoal, and shingles for home use.

Oak, White and Bur.—These two species supply practically all of the bourbon and oil stave material in the state. Small amounts of the better logs are sold as furniture veneer logs. Other uses are tool handles, flooring, furniture, railroad ties, mine timbers, telephone poles, pins and brackets, wagon wheel hubs, fuel wood, bridge and construction timbers. On the farm these species are used extensively for fence posts. Sawdust from stave mills is used in the manufacture of certain types of brick. Basket weaving uses a very limited quantity of these species. In recent months (1941), post oak is being used to a limited extent for staves.

Pine, Shortleaf.—This pine, found only in the southern half of the state, is the only merchantable native pine. It is used for general construction, flooring, boxes and crates, and interior trim. A small quantity is used for posts and poles. A few poles are used in the manufacture of steel to remove impurities. A few pine shingles are made for home use and local sale.

Poplar, Tulip.—The supply of tulip poplar is limited. Where available it is used for furniture veneer logs, interior trim, slack cooperage, and cabinet work.

Sycamore.—Sycamore is used for veneer for furniture, baskets and crates, lumber for flood control mattresses, slack cooperage, small dimension stock, and interior trim.

Walnut, Black.—This is the most valuable timber species in the state. Veneer logs, furniture lumber, gun stocks, and caskets consume most of the available walnut. One flooring plant makes a small amount of walnut flooring. The nuts are of commercial importance in some parts of the state.

Willow.—Willow is an unimportant species commercially, the only important uses being for pulp wood and shredded wood.

The following three species are important for uses other than lumber:

Catalpa.—Most catalpa used comes from plantations and is used for fence posts and a small amount for novelties.

Black Locust.—Black locust is important as fence posts.

Osage Orange.—Used to a limited extent for archery bows and extensively for fence posts.

The following is a directory of wood-using industries from which reports were received, showing the type of raw material they use. Due to present conditions many may now be using other material than is shown in this list. This list is given primarily to show the wide variety of timber products used and should not be construed as showing all wood-using industries in the state.

Sawmills are not shown here since their number runs into the hundreds but a list by counties is available for all large mills and most of the smaller ones.

Abbreviations Used

- | | |
|----------------------------------|------------------------------------|
| AD—Air dry | M—1000. |
| C—Common | M. R.—Mill run |
| S-4-S—Surfaced 4 sides (dressed) | r. l.—Random length |
| KD—Kiln dry | r. l. & w.—Random length and width |
| bd. ft.—Board feet | r. w.—Random width |

Firm Name—Address

Raw Material

Archery Bows

Fahlin Mfg. Co., ColumbiaOsage orange bolts

Boxes and Crates

Dillima Industries, Inc., CaruthersvilleCottonwood. Hardwood logs and lumber.

Gideon-Anderson, St. LouisHardwood logs 10" and up, clear. Lumber 1" r. l. & w. #2 and better.

F. M. Wise Mfg. Co., AuroraOak slabs and edgings.

General Box Co., Kansas City4/4" and 5/4" cottonwood. r. l. & w. Veneer.

W. T. Letts Box Mfg. Co., St. JosephLogs, cottonwood, sycamore, and maple, any size.

M. E. Lemming, Cape GirardeauLogs and lumber, any species

Flehigh Box and Lbr. Co., St. LouisPine 1"x4", 1"x6", 2"x4", 4"x4"

Columbia Box Co., St. LouisCottonwood and gum lbr. 8"-16" wide, 12'-16' long.

Phillip Gruner & Bros. Lbr. Co., St. LouisTimbers 2"x4" to 12"x12". West coast pine and fir.

C. J. Reinecke Lbr. Co., St. LouisRough green oak. Yellow pine, S-4-S. Gum, cypress, and tupelo.

Caskets

J. Hamilton, SpickardWalnut lbr.

Kregel Casket Co., St. LouisCypress lbr.

Commission

Consolidated Sawmills Co., St. LouisHardwood and pine lbr. 1"-4" thick, 6'-16' long.

W. T. Ferguson Lbr. Co., St. LouisRough, green oak, sycamore, pine, 1"x4", 12'-20' long.

Creosoting Plants

Long-Bell Lumber Co., Joplin Posts, piling, lumber, ties.
 Wood Preserving Corp., Kansas City Posts, poles, ties.
 Madry Lumber Mills, Branson, RD Pine posts (hot bath).

Coops (Poultry)

Shelton Mfg. Co., Jonesburg Cottonwood and hardwood, logs and bolts.

Cooperage

Bott Bros. Cooperage, Alexandria White and red oak staves 42", yellow pine heading.

Pioneer Cooperage Co., St. Louis White oak staves and heading.
 Wunderlich Cooperage Co., St. Louis Gum, elm, hackberry, ash, cottonwood, poplar staves.

St. Louis Cooperage Co., St. Louis White oak, gum, fir staves, and heading.

Chess and Wymond, Cuba Bourbon staves, white oak stave bolts.

Crutches and Canes

Mid-West Crutch and Cane Co., St. Marys Maple 1" dry-clear. Rosewood.

Decoy Ducks

H. Bent, Jefferson City "Pop" ash 4"x6".

Farm Implement Parts

J. W. Gearhardt, Cape Girardeau Hickory logs #2 and better.

Fulkerson Bros. Handle Co., Puxico Hickory, ash, and oak bolts.

Fletcher Lumber Co., East Prairie Hickory, ash, and oak bolts.

Flooring (Oak)

Ozark Flooring Co., Bismark Green or dry oak lbr. 4" wide and up, 8' long and up, cut 1½" green.

Hurbert Shephard, Pierce City, RD #2 Logs, oak.

Missouri Flooring Co., Birch Tree Oak logs and 1½" oak lumber.

J. E. Boswell, Lebanon Oak logs and 1½" oak lumber.

Geo. D. Griffith, Springfield Oak logs and 1½" oak lumber.

Fuel Wood

C. A. Allman, Anderson Fuelwood 12"-16" long.

City Ice and Fuel Co., St. Louis Oak and hickory 4' long.

Merchants Ice and Fuel Co., St. Louis Oak and hickory 4' long.

St. Agnes Coal Co., St. Louis Oak and hickory 4' long.

Furniture

Buchanan Shop, St. Louis Gum, maple, walnut, oak, birch, beech, AD. 1"-4" thick, r. l. & w.

Modern Krafts, St. Louis Ash, maple, oak, walnut, yellow pine, KD.

Prost and Son, St. Louis Mahogany, pine, and oak. 4/4"-5/4"-6/4" all grades.

G. A. Haseman, St. Louis Oak, walnut, and maple. Mahogany veneer.

St. Louis Mfg. Co., St. Louis Walnut, oak, birch, mahogany, poplar, cottonwood, and basswood, 1"-1½", 10'-16' long. AD.

Maguolo Cabinet Co., St. Louis Oak, poplar, walnut, and mahogany. 1"-1½", 14'-16'. KD.

Laclede Woodwork Co., St. Louis Poplar, ponderosa pine, and willow, S-4-S, KD.

Watson Mfg. Co., St. Louis Gum, soft maple, and magnolia. Rough. AD.

Monroe Cabinet Mfg. Co., St. Louis Sycamore, soft maple, and gum veneer. 1"-6" thick, r. l. & w. AD.

Blumer Cabinet Co., St. Louis Oak, mahogany, and walnut lbr. 1"-2½" thick, 8'-16' long, rough. Veneer.

Schmidt, St. Louis (Billiard tables) Oak, walnut, poplar, sitka spruce, mahogany, rosewood, ¾"-2" AD and KD. Yellow pine and cypress crating.

American Furniture Co., St. Louis Poplar, beech, gum, and walnut. All grades 1"-2" thick 4" and up, 6' and up. Fir and gum panels.

H. Pauk & Sons Mfg. Co., St. Louis Pine, oak, maple, birch, poplar, cypress lbr. ¾"-2" thick, 8'-16' long.

V. Sauter, St. Louis	Oak, walnut, birch, willow, poplar, and cypress lbr. KD. S-4-S.
Queen City Woodworking Co., Springfield	Oak and walnut, rough, green.
Broemmer Furniture Works, Hannibal	Cypress, oak, walnut, gum, and poplar lbr. AD #1 and 2.
Lahome Swing Co., Perryville	Oak lbr. M. R. AD rough.
Wood Products, Prison Industries, Jefferson City	Walnut lbr.—Stumpage, any species.
Manning-Wilson Table Co., Kirksville	Douglas fir plywood, white pine and oak lbr. KD S-4-S.
Richards Hobby Shop, Mexico	Walnut, cherry, yellow pine and fir plywood.
Dingman Blacksmith Shop, Polo	Walnut and cherry. Rough.
Ehrlich and Sons Mfg. Co., St. Joseph	Pine, mahogany, S-4-S. Walnut and cottonwood lbr., rough. Plywood and panels.
J. Hamilton, Spickard	Walnut and pine lbr., plywood.
St. John Cabinet Co., Liberty	Walnut lbr.
Sheridan Cabinet Co., Kansas City	Poplar, oak, walnut, birch, and maple lbr. Panels.
Champlain Cabinet Shop, Greenfield	Walnut lbr. Plywood.
Ideal Manufacturing Co., Warsaw	Oak lbr., rough, green.
Linn Cabinet Co., Linn	Cherry and walnut lbr. S-4-S.
Freedom Mill and Cabinet Co., Freedom	Oak, cherry, ash, walnut, and cedar lbr. Rough. Green.
O. E. White, Stover	Walnut and oak lbr. Rough.
King Cabinet Co., Kansas City	Pine and plywood.

Gun Stocks and Blanks

B. C. Bishop & Son, Warsaw	Walnut logs 12" diam. 6' long and up.
American Walnut Co., Kansas City, Kans.	Walnut logs 12" diam. 6' long and up.
Iowa-Missouri Walnut Co., St. Joseph	Walnut logs.

Handles and Blanks (Tool)

Fulkerson Bros. Handle Co., Puxico	Hickory, ash, and oak bolts.
Potosi Mfg. Co., Potosi	Hickory bolts 40" long, 8" diam. and up.
IXL Handle Co., Dexter	Hickory and white oak bolts.
Northern Handle Co., Bellview	Hickory bolts.
Hanna and Young, Poplar Bluff	Ash bolts. (Farm tool handles).
Poplar Bluff Handle Works, Poplar Bluff	Hickory bolts and handle blanks.
Sheridan Handle Co., Williamsville	Hickory bolts.
Woot Keathley, Patterson	Hickory bolts.
E. W. Fitz, Des Arc	Hickory bolts.
J. I. Hackworth, Ruble	Hickory bolts.
J. H. Dale, Doniphan	Hickory bolts (makes blanks only).
Ellis Griffith, Doniphan	Hickory bolts (makes blanks only).
Beamer Handle Co., Van Buren	Hickory bolts.
Hall and Nolen, Washburn (Barry Co.)	Hickory bolts.
McCruider Bros., Wayne (Barry Co.)	Hickory bolts.
J. W. Misenhelter, Hamilton	Hickory bolts.
V. W. Brondel, Jefferson City	Hickory and white oak bolts.
Blue Oak Co., Bowling Green	Hickory, sugar maple, white oak, and ash bolts.
C. D. Finley, Jonesburg	Maple, hickory, and oak bolts, and stumpage.
C. A. Allman, Anderson	Hickory bolts.

Millwork

Julian Lumber Co., Poplar Bluff	Oak and pine lumber.
Madry Lumber Mills, Branson RD	Pine lumber, Pine posts.
R. E. Miller, Longtown	Oak, poplar, pine, and hickory lbr. AD. #2 and better.
C. J. Reisenbichler Lbr. and Mill Works, Cape Girardeau	Pine, oak, and hickory lbr.
United Planing Co., Hannibal	Oak and pine, all sizes.

Hannibal Woodwork Co., HannibalYellow pine, fir, and hardwoods, all sizes, AD.
 Bareis and Son, HannibalMaple, walnut, cedar, white pine, and cypress, AD.
 St. Louis Stair Co., St. LouisRed oak, yellow pine, poplar, and gum, 5/4" r. l. & w. B&B. AD.
 Kelly Manufacturing Co., St. LouisOak, white pine, yellow pine. r. l. & w. B&B. KD.
 N. Joplin Planing Mill, JoplinPine and fir lumber.

Mine Timbers

Egyptian Tie and Timber Co., St. LouisOak props.
 Clark and Wilson Coal Co., RichmondMine props, any species, 2 1/2'-3' long, 4"-6" diam.
 Central States Tie and Lbr. Co., St. LouisProps and mine ties, oak.
 Lee Coal Co., RichmondMine props.
 Robert Blair, RichmondMine props.

Mouse Traps

Booth Manufacturing Co., BethanyDouglas fir plywood.

Novelties

Ozark Highlanders (Max Krodinger), De Soto, RDCherry, cedar, and walnut lbr.
 Painter Novelty Co., NoelCedar and walnut. r. l. & w.
 Blair Novelty Co., CamdentonCedar lumber.
 Ozark Novelty Works, Branson, RDCedar lumber and bolts.
 Shade Ridge Store, Branson, RDCedar, maple, and walnut logs.
 Ozark Homecrafters (Chas. Whartenby), AndersonOak, cherry, maple, walnut, and cedar logs, and stumpage.
 Jenkins Novelty and Toy Shop, KeytesvillePine, oak, elm, and walnut lbr., rough and S-4-S.
 Martcraft, King CityWalnut, cherry, maple, cedar, pine, and mahogany, S-4-S. Dry.
 Pat Deen, AuxvasseFir and gum plywood. Small amount, white pine.
 Hutchison General Store, Benton CityWalnut, cherry, and catalpa.
 Hoefler Novelty Co., BuffaloPartly manufactured cedar novelties.
 Lewis and Turner, CamdentonAsh lbr.

Pencils

Wallace Pencil Co., St. LouisWestern red cedar slats.

Pins and Brackets (Telephone)

Ozark Pin and Bracket Co., VersaillesOak bolts. 12" diam. and up.

Pipes, Smoking

Pugh Pipe Co., Bowling GreenHickory poles, 1 1/2"-2 1/4" diam.
 Corn Cob Pipe Mfg. Co., BoonvilleHickory poles.

Propellers, Airplane

Fahlin Mfg. Co., ColumbiaBirch lbr.

Pulpwood

Cottonwood Fiber Co., St. LouisSoft maple, box elder, willow, and cottonwood bolts.

Railroad Ties

Egyptian Tie and Timber Co., St. LouisR. R. ties, tie cuts, stumpage.
 Central States Tie and Lumber Co., St. LouisR. R. ties, mine props.
 T. J. Moss Tie Co., St. LouisR. R. ties.
 Missouri Tie and Lumber Co., St. LouisR. R. ties.
 Potosi Tie and Timber Co., St. LouisR. R. ties.
 Hobbs-Western Tie Co., St. LouisR. R. ties.
 Saylor Tie and Lumber Co., St. LouisR. R. ties.
 Jane and Cross Tie Co., St. LouisR. R. ties.
 Wood Preserving Co., St. LouisR. R. ties.
 C. A. Allman, AndersonR. R. ties #1 and rejects

Saddle Stirrups

Radcliff Mfg. Co., AgencyAsh, hickory, elm, hackberry, pecan bolts.
Basswood logs.

Shingles

Jack Ferris, GladdenPine bolts.

Shredded Wood

Wm. Lanegan, LouisianaCottonwood, elm, soft maple, bolts, green or dry.
Cottonwood Fiber Co., St. LouisCottonwood logs.

Small Dimension Stock

Fletcher Lumber Co., East PrairieMaple, ash, gum, oak, and walnut bolts.
Storms Co., Inc., BertrandGum, sycamore, elm, and cottonwood, rough lbr.
Tucker and Sons, FrankfordWalnut, ash, oak, and soft maple logs and bolts.

Skis

Fahlin Mfg. Co., ColumbiaHickory lumber.

Stave Mills (Slack)

East Prairie Stave Co., East PrairieGum, elm, sycamore, and hackberry
bolts, 8" and up, 32" long.
Geo. McBride Cooperage Co., CharlestonSame as above.
Poplar Bluff Stave Co., Poplar BluffGum, elm, sycamore, hackberry,
cottonwood, poplar, and birch bolts.
Wunderlich Cooperage Co., HaytiSame as above.
Gideon-Anderson, GideonSame as above.

Stave Mills (Tight)

Orrs R. Case, St. ClairWhite oak stumpage and stave bolts.
M. J. Standridge, GeraldWhite oak stumpage and stave bolts.
A. D. Welch, FayetteWhite oak heading bolts and stumpage.
Thomas Gadberry, FristoeWhite oak stave bolts.
Hobert B. Jones Stave Co., HartvilleWhite oak stave and heading bolts.
Oak Grove Stave Co., Springfield RDWhite oak stave and heading bolts
and stumpage.
Boswell Flooring Co., LebanonWhite oak stave and heading bolts and
stumpage.
G. R. Crisp, GainsvilleWhite oak stave bolts and stumpage.
L. G. Bulgin Stave Co., CamdentonWhite oak stave bolts and stumpage.
Berharst and Mathes, FreeburgWhite oak stave bolts.
Chickasaw Wood Products Co., Memphis, Tenn.White oak stumpage
and bolts.
C. E. Menkin, Jefferson CityWhite oak stumpage and bolts.
G. W. Moses, New OffenburgWhite oak stave bolts.
H. T. McGowan, AshleyWhite oak stave bolts and stumpage.
Lebanon Stave Mill, LebanonWhite oak stave bolts and stumpage and
black oaks.
Pioneer Cooperage Co., St. LouisWhite oak stave bolts.
E. F. Buffington, EllingtonWhite and black oak stave bolts.
Geo. McBride Cooperage Co., CharlestonAsh stave bolts.

Veneer (Basket and Box)

Missouri Veneer Co., MokaneCottonwood, elm, and sycamore logs.
14" diam. and up.
Price Box and Basket Co., NeoshoCottonwood, elm, sycamore, and maple
logs.
Swarz Box and Basket Co., LouisianaCottonwood, elm, maple, sycamore,
hackberry, and birch logs, 14" and up.

Veneer (Furniture)

St. Louis Basket and Box Co., St. LouisWalnut, gum, poplar, ash, maple,
and cottonwood logs.
Penrod, Jurden, and Clark Walnut Co., Kansas CityWalnut logs.

Wagon Hubs

R. S. Martin, WinonaWhite oak blocks and stumpage.

Walnut (Buyers)

Iowa-Missouri Walnut Co., St. JosephWalnut logs.
Ozark Hardwood Lumber Co., SpringfieldWalnut logs.
Chillicothe Walnut Corp., ChillicotheWalnut, sycamore, and maple logs.
Wood Mosaic, HannibalWalnut and white oak logs.
Boonville Veneer Co., BoonvilleWalnut logs.
Penrod, Jurden, and Clark, Kansas CityWalnut logs.
American Walnut Co., Kansas City, Kan.Walnut logs.
B. C. Bishop & Son, WarsawWalnut logs.
Pickrel Walnut Co., St. LouisWalnut logs.
Frank Purcell, Kansas City, Kan.Walnut logs.
St. Louis Basket and Box Co., St. LouisWalnut logs.

Wood Fiber

Cottonwood Fiber Co., St. LouisCottonwood logs.

Wood Distillation (Charcoal)

Hardwood Charcoal Co., SteelvilleHardwood cordwood 4½' long.
Missouri Charcoal Co., ReynoldsHardwood cordwood 4' long.
McDonald Charcoal Co., Jefferson CityHardwood cordwood 4' long.

MISCELLANEOUS**Apiarist's Supplies—Incubators—Evaporator Coolers**

Leahy Manufacturing Co., HigginsvilleWestern pines and redwood lbr.
S-2-S. r. l. & w. Cypress and southern yellow pine.

Brick Manufacture

A. P. Green Brick Co., MexicoCottonwood, willow, maple, and white
oak M. R. Green. AD maple and white oak. Sawdust (mostly
white oak from stave mills).
Mexico Refractory Co., MexicoCottonwood, elm, maple crating, oak
decking. Maple sawdust, dry.

Handles (Electrical equipment)

Modern Woodwork Co., St. LouisWalnut lbr. 1" #2.

Pattern Making

John Kibviz Pattern Co., St. LouisWhite pine, KD. S-4-S.

Pickle Separators

Standard Machine Co., CantonFir, ponderosa pine and mixed hardwoods.

Piling

Central States Tie and Lumber Co., St. LouisPiling.

Stave Assembly Plant

Chess and Wymond, CubaBourbon staves (white oak).

Venetian Blinds

Carl Wellekoetter, RichmondWestern red cedar.

TYPE OF DATA COLLECTED
Wood Utilization Study for Sawmills

The following forms were used for collecting the field data.

1. Owner's name..... Mill name.....
 2. Address of owner: County..... Town..... Street.....
 3. Location of mill: County..... Twp.....
 4. Type of mill: Portable..... Stationary.....
 5. Type of work: (custom, sawing, etc.).....
 6. Material cut (ties, lumber, etc.).....
 7. Operated by owner or employee..... 8. Daily capacity.....
 9. Approx. No. weeks operated per year by months.....
 10. No. men employed: in woods..... in mill.....
 11. Annual output by species.....
 12. Special cut.....
 13. Source of supply.....
 14. Distance from woods to mill.....
 15. Method of transportation of logs to mill.....
 16. Method of transportation of sawed material.....
 18. Cost of transportation to mill per M.....
 19. Cost of sawing per M.....
 20. Logs cut or bought delivered to mill.....
 21. Could more material be cut and sold if available?.....
 22. How long will present supply last?.....
 23. Specifications for logs.....
 24. Are logs bought by scale or in bulk?.....
 25. What log rule used for purchase of logs?.....
 26. Approx. % defect in logs by species.....
 27. Cause of defect.....
 28. Smallest log profitable to cut.....
 29. Is lumber graded or sold mill run?.....If graded, approx. % by grades.....
 30. Would grading lumber be profitable?.....
 31. What use, if any, is made of slabs, edgings, etc.?.....
 32. Markets: Local..... Steady or seasonal.....
 33. Price per M. (f. o. b. mill and delivered) by species.....
 34. Value of mill..... Annual payroll.....
 35. Type of power (steam, gasoline).....
 36. Equipment and condition in mill (planer, edger, cut-of saw, etc.).....
- Remarks:

Wood Using Industries Study

1. Firm Name.....
2. Address: County..... Town..... Street No.....
3. Products manufactured.....
4. Amount produced annually.....
5. Type of plant: Permanent..... Semi-..... Temporary.....
6. If temporary, no. weeks worked per year.....
7. No. years in present business in present location.....
8. Type of raw material used: Rough..... Dimension..... Finished..... Logs.....
9. Specifications for materials (Size, length, diam., grade).....
.....
10. Amount purchased annually by species, states and distance.....
.....
11. Size of individual orders of raw material.....
12. Per cent by species grown in Mo.....
13. Method of shipping raw materials (truck, rail, water).....
14. Is present supply adequate and satisfactory?.....
- 14a. If in market, give specifications.....
15. Material desired not now available locally.....
16. Could any local species be substituted for species now imported?.....
.....
17. Objections to local wood.....
18. Qualities desired in wood used.....
19. Uses, if any, made of waste material.....
20. No. permanent employees..... No. temporary.....
21. Annual payroll..... Value of plant.....
22. What substitutes are replacing products now made from wood?.....
.....
23. Market for manufactured products: % in Mo.....
% other states..... % foreign.....

For Land Owners Only

1. No. acres owned..... 2. Approx. No. M bd. ft. by species.....
3. No. years' supply available.....
4. Method of cutting (clear, selective, etc.).....
5. Brush disposal.....
6. Fire protection.....
7. Use of land in addition to timber production (recreation, grazing, etc.).....
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