Commonwealth of Pennsylvania

DEPARTMENT OF FORESTRY

ROBERT S. CONKLIN, Commissioner of Forestry
in Cooperation With the
Forest Service, U. S. Department of Agriculture
HENRY S. GRAVES, Forester

Wood-Using Industries

OF PENNSYLVANIA

By ROGER E. SIMMONS,
United States Forest Service,
1912.

HARRISBURG, PA.:
WM. STANLEY RAY, STATE PRINTER
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Fig. 1.—Virgin hemlock mixed with white pine in the Jack's Mountain Division of the Seven Mountains' State Forest. Shows types which Pennsylvania did and can produce.
CONTENTS

Introduction .......................................................................................................................... 8
Purpose of the Study ............................................................................................................... 9
Forest Conditions .................................................................................................................. 10
Importance of Manufacturing ............................................................................................... 12
Future Timber Supply .......................................................................................................... 12
Scope of the Study ................................................................................................................ 13

Part I.

Kinds of Wood ..................................................................................................................... 14
The Woods Grown in Pennsylvania ..................................................................................... 17
Specific Descriptions ........................................................................................................... 18

SOFTWOODS ....................................................................................................................... 19
Pines ........................................................................................................................................ 19
Hemlocks .............................................................................................................................. 27
Cypress .................................................................................................................................. 28
Spruce .................................................................................................................................... 29
Douglas Fir ........................................................................................................................... 30
Cedars ..................................................................................................................................... 31
Redwood ............................................................................................................................... 32
Tamarack .............................................................................................................................. 32
Balsam Fir ............................................................................................................................. 33

THE HARDWOODS ............................................................................................................ 33
Oaks ......................................................................................................................................... 34
Yellow Poplar ....................................................................................................................... 35
Maples ................................................................................................................................... 37
Chestnut ................................................................................................................................. 39
Beech ..................................................................................................................................... 40
Red Gum ............................................................................................................................... 42
Basswood .............................................................................................................................. 43
Birches ................................................................................................................................... 44
Hickories ............................................................................................................................... 45
Ashes ....................................................................................................................................... 47
Elms ......................................................................................................................................... 48
Cottonwood .......................................................................................................................... 49
Gums ....................................................................................................................................... 50
Cherry ...................................................................................................................................... 52
Black Walnut ........................................................................................................................ 52
Sycamore ............................................................................................................................. 53
Hornbeam ............................................................................................................................. 54
Black Locust ........................................................................................................................ 55
Cucumber .............................................................................................................................. 55
Buckeye .................................................................................................................................. 56
Applewood ............................................................................................................................ 57
Dogwood ............................................................................................................................... 57
Persimmon ............................................................................................................................. 58
Butternut ............................................................................................................................... 58
Minor Species ....................................................................................................................... 59
Foreign Woods ..................................................................................................................... 59

Description of Qualities ..................................................................................................... 60

Part II.

INDUSTRIES ....................................................................................................................... 61
Planing Mill Products ........................................................................................................... 63
Boxes..................................................................................................................................... 65
Car Construction .................................................................................................................. 68

(3)
<table>
<thead>
<tr>
<th>Category</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furniture</td>
<td>69</td>
</tr>
<tr>
<td>Chairs</td>
<td>73</td>
</tr>
<tr>
<td>Vehicles and Vehicle Parts</td>
<td>76</td>
</tr>
<tr>
<td>Ships and Boats</td>
<td>78</td>
</tr>
<tr>
<td>Caskets and Coffins</td>
<td>82</td>
</tr>
<tr>
<td>Mine Equipment</td>
<td>84</td>
</tr>
<tr>
<td>Mine Rollers</td>
<td>85</td>
</tr>
<tr>
<td>Sprags</td>
<td>86</td>
</tr>
<tr>
<td>Fixtures</td>
<td>88</td>
</tr>
<tr>
<td>Cloth, Hosiery Boards, etc.</td>
<td>90</td>
</tr>
<tr>
<td>Patterns and Flasks</td>
<td>91</td>
</tr>
<tr>
<td>Handles</td>
<td>93</td>
</tr>
<tr>
<td>Laundry Appliances</td>
<td>96</td>
</tr>
<tr>
<td>Cigar Boxes</td>
<td>98</td>
</tr>
<tr>
<td>Woodenware and Novelties</td>
<td>99</td>
</tr>
<tr>
<td>Tanks, Vats, and Silos</td>
<td>101</td>
</tr>
<tr>
<td>Machine Construction</td>
<td>102</td>
</tr>
<tr>
<td>Agricultural Implements</td>
<td>105</td>
</tr>
<tr>
<td>Toys</td>
<td>107</td>
</tr>
<tr>
<td>Trunks and Valises</td>
<td>109</td>
</tr>
<tr>
<td>Brushes</td>
<td>110</td>
</tr>
<tr>
<td>Shuttles, Spools and Bobbins</td>
<td>111</td>
</tr>
<tr>
<td>Dalrymen's and Poulterers' Supplies</td>
<td>112</td>
</tr>
<tr>
<td>Musical Instruments</td>
<td>113</td>
</tr>
<tr>
<td>Machinery and Electrical Apparatus</td>
<td>114</td>
</tr>
<tr>
<td>Water Pipes and Pumps</td>
<td>115</td>
</tr>
<tr>
<td>Baskets and Veneer Packages</td>
<td>115</td>
</tr>
<tr>
<td>Frames and Mouldings</td>
<td>116</td>
</tr>
<tr>
<td>Refrigerators and Kitchen Cabinets</td>
<td>117</td>
</tr>
<tr>
<td>Excelsior</td>
<td>118</td>
</tr>
<tr>
<td>Playground Equipment</td>
<td>119</td>
</tr>
<tr>
<td>Printing Material</td>
<td>120</td>
</tr>
<tr>
<td>Ladders</td>
<td>121</td>
</tr>
<tr>
<td>Elevators</td>
<td>122</td>
</tr>
<tr>
<td>Canes and Whips</td>
<td>123</td>
</tr>
<tr>
<td>Plumbers' Woodwork</td>
<td>124</td>
</tr>
<tr>
<td>Insulator Pins and Brackets</td>
<td>125</td>
</tr>
<tr>
<td>Butchers' Blocks and Skewers</td>
<td>126</td>
</tr>
<tr>
<td>Weighing Apparatus</td>
<td>127</td>
</tr>
<tr>
<td>Professional and Scientific Instruments</td>
<td>128</td>
</tr>
<tr>
<td>Pulleys and Conveyors</td>
<td>129</td>
</tr>
<tr>
<td>Boot and Shoe Findings</td>
<td>130</td>
</tr>
<tr>
<td>Smoking Pipes</td>
<td>131</td>
</tr>
<tr>
<td>Sporting and Athletic Goods</td>
<td>132</td>
</tr>
<tr>
<td>Saddles and Harness</td>
<td>133</td>
</tr>
<tr>
<td>Gates and Fencing</td>
<td>134</td>
</tr>
<tr>
<td>Clock Cases</td>
<td>135</td>
</tr>
<tr>
<td>Rollers and Poles</td>
<td>136</td>
</tr>
<tr>
<td>Manual Training Practice</td>
<td>137</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>138</td>
</tr>
</tbody>
</table>

Part III.

<table>
<thead>
<tr>
<th>Category</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood Uses</td>
<td>145</td>
</tr>
<tr>
<td>Directory of Manufacturers</td>
<td>177</td>
</tr>
</tbody>
</table>

APPENDIX.

<table>
<thead>
<tr>
<th>Category</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rough Forest Products</td>
<td>201</td>
</tr>
<tr>
<td>Lumber</td>
<td>201</td>
</tr>
<tr>
<td>Laths</td>
<td>202</td>
</tr>
<tr>
<td>Shingles</td>
<td>202</td>
</tr>
<tr>
<td>Cooperage</td>
<td>202</td>
</tr>
<tr>
<td>Pulpwood</td>
<td>203</td>
</tr>
<tr>
<td>Hardwood Distillation</td>
<td>204</td>
</tr>
<tr>
<td>Veneer</td>
<td>204</td>
</tr>
</tbody>
</table>
**LIST OF ILLUSTRATIONS**

<table>
<thead>
<tr>
<th>Fig.</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Virgin hemlock mixed with white pine in Jack's Mountain Division of Seven Mountains' State Forest</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Collection of finished boxes, made in Pennsylvania</td>
<td>64</td>
</tr>
<tr>
<td>3</td>
<td>Box shocks and nailing machine in a Pennsylvania box factory</td>
<td>65</td>
</tr>
<tr>
<td>4</td>
<td>Interior of a small Philadelphia box factory. Boxes when nailed are used for city trade</td>
<td>65</td>
</tr>
<tr>
<td>5</td>
<td>Utilization of mill waste. Rough squares are bolted from slabs and edgings, and then turned into chair stock</td>
<td>76</td>
</tr>
<tr>
<td>6</td>
<td>Chair parts and the squares or dimension stock from which they are made</td>
<td>76</td>
</tr>
<tr>
<td>7</td>
<td>Parts of a farm wagon and the woods used in their manufacture</td>
<td>76</td>
</tr>
<tr>
<td>8</td>
<td>Showing parts of delivery wagons and woods used</td>
<td>76</td>
</tr>
<tr>
<td>9</td>
<td>Body of an old-time Conestoga wagon. This style of wagon is still being manufactured in Pennsylvania</td>
<td>76</td>
</tr>
<tr>
<td>10</td>
<td>Hickory, oak and pine waste of a large Pennsylvania wagon manufacturer being sold for fuel</td>
<td>76</td>
</tr>
<tr>
<td>11</td>
<td>Manufacture of limousine bodies</td>
<td>77</td>
</tr>
<tr>
<td>12</td>
<td>River scows after being launched, and ready to be taken to market down the Allegheny River</td>
<td>86</td>
</tr>
<tr>
<td>13</td>
<td>Racing shell being built by a Pennsylvania manufacturer for the University of Pennsylvania</td>
<td>86</td>
</tr>
<tr>
<td>14</td>
<td>Manufacture of mine sprags in Northern Pennsylvania</td>
<td>87</td>
</tr>
<tr>
<td>15</td>
<td>Standard dimensions of a mine sprag</td>
<td>87</td>
</tr>
<tr>
<td>16</td>
<td>Tier bins for provision store</td>
<td>100</td>
</tr>
<tr>
<td>17</td>
<td>Dimensions of a wrapping board</td>
<td>100</td>
</tr>
<tr>
<td>18</td>
<td>Foundry flasks</td>
<td>100</td>
</tr>
<tr>
<td>19</td>
<td>Sixty different kinds of novelties made by one manufacturer of Pennsylvania</td>
<td>100</td>
</tr>
<tr>
<td>20</td>
<td>Product of a woodenware manufacturer of Philadelphia</td>
<td>101</td>
</tr>
<tr>
<td>21</td>
<td>Oil tank staves preparatory to assembling</td>
<td>110</td>
</tr>
<tr>
<td>22</td>
<td>Finished oil tank</td>
<td>110</td>
</tr>
<tr>
<td>23</td>
<td>Manufacture of toy pianos</td>
<td>110</td>
</tr>
<tr>
<td>24</td>
<td>Woodworking department of a toy manufacturer. Making wooden dolls</td>
<td>110</td>
</tr>
<tr>
<td>25</td>
<td>Brush blocks</td>
<td>111</td>
</tr>
<tr>
<td>26</td>
<td>Brush blocks</td>
<td>111</td>
</tr>
<tr>
<td>27</td>
<td>Manufacture of pipe organs</td>
<td>122</td>
</tr>
<tr>
<td>28</td>
<td>Piano cases and kinds of wood used in their manufacture</td>
<td>122</td>
</tr>
<tr>
<td>29</td>
<td>Action parts of upright piano</td>
<td>123</td>
</tr>
<tr>
<td>30</td>
<td>Interior of excelsior factory, showing billets in place in excelsior machines</td>
<td>134</td>
</tr>
<tr>
<td>31</td>
<td>Finished excelsior ready for bailing</td>
<td>134</td>
</tr>
<tr>
<td>32</td>
<td>Whips, canes, and umbrella handles, and rough stock from which they are manufactured</td>
<td>134</td>
</tr>
<tr>
<td>33</td>
<td>Manufacture of shoe lasts. Roughly cut billets and the finished lasts turned from them</td>
<td>135</td>
</tr>
<tr>
<td>34</td>
<td>Evolution of a shoe last</td>
<td>135</td>
</tr>
<tr>
<td>35</td>
<td>Evolution of a briar pipe</td>
<td>142</td>
</tr>
<tr>
<td>36</td>
<td>Evolution of a gun stock and a number of finished stocks ready for market, made of black and Circassian walnut</td>
<td>143</td>
</tr>
</tbody>
</table>
NOTICE

The study upon which this report is based was undertaken by the Department of Forestry of Pennsylvania in cooperation with the United States Forest Service, the work being done under the direction of Robert S. Conklin, Commissioner of Forestry of Pennsylvania, and O. T. Swan, in charge Office of Industrial Investigations, United States Department of Agriculture. The statistics were compiled from data collected in the summer of 1912, covering a period of one year from July 1, 1911 to June 30, 1912, inclusive.

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WOOD- USING INDUSTRIES OF PENNSYLVANIA

INTRODUCTION.

In the work of practical forestry, Pennsylvania is a leading State and bears this distinction as a result of the development and operation of an effective State-wide policy. To this Commonwealth also properly belongs the credit of being the cradle of American forestry. When William Penn made the well known provision in the Charter of Rights, that for every five acres cleared one should be left in woods, the seed of forestry was first sown. Following this, as early as 1700, the proprietary Government enacted forest fire laws, and from that time to the present, State Legislatures have debated upon and passed similar enactments. Popular sentiment favoring the practice of forestry by the State, grew steadily from the beginning, but in the past 20 years it has developed with remarkable rapidity. Directing this educational propaganda were men who have since gained prominence and who stand high among those recognized as authorities pertaining to forestry subjects.

Naturally, much has been written and said on all phases of forest conservation and improvement in Pennsylvania. In the discussions, the economic importance of forests, aside from the collateral values they are regarded as possessing, has been reckoned usually in terms of production of the rougher forest products, such as lumber, lath, shingles, crossties, cooperage stock, telegraph poles, fence posts, mine timbers, cordwood for fuel and distillation purposes. The commercial gain that comes to the State through the millions of feet of lumber that the forests supply through their conversion into such finished commodities as vehicles, boxes, handles, novelties, has always been recognized; but reference thereto has been made only in a casual manner as the detailed data have not heretofore been available. It is a well established fact that the cutting and shipping away of lumber and other forest materials like pulp wood, cooperage stock, chemical wood, etc., is not as permanent a commercial and industrial gain as when those materials find a home market and are held for the manufacture of finished articles within the State, but to what extent this development has taken place in Pennsylvania, no previous investigation has ever attempted to ascertain. This study has been projected, therefore, with this special view, and of outlining the relations of the wood-consuming industries to the growing forests, as well as of collecting information respecting wood uses and factory waste.

The information presented in this report covers the period of twelve months, prior to July, 1912. It was gathered in the late summer and fall of that year by the Department of Forestry of Pennsylvania, and by the Forest Service, United States Department of Agriculture, working under a cooperative agreement. The information was solicited from the manufacturers, not only from those producing complete wooden commodities, but from those making wooden parts of products, axe handles, brush blocks, and piano cases, for example; those factories that use lumber as a means of manufacturing other commodities, like patterns and flasks in foundry work, and factories of all kinds that require lumber in the marketing of their wares by manufacturing their own boxes and crates. The names and locations of all manufacturers were obtained through the assistance of the postmasters in the
State, and the thoroughness and accuracy of this report were made possible by the kind co-operation of the wood users in giving detailed information as to their individual operations. Report blanks were mailed to each, with the request that they be filled in and returned. After a time, agents representing Pennsylvania and the Federal Government were sent throughout the State to visit factories which had failed to report, and more particularly to study at close range processes of manufacture, waste problems, and industrial conditions. On completion of the field work, in accordance with agreement, the data were compiled and the report written by the office of Industrial Investigations of the Forest Service, whereupon the manuscript was turned over to the Pennsylvania Department of Forestry for revision and publication.

For a number of years the Federal Government has kept a record of the annual production of rough lumber and other forest products by States, and for the last seventeen years the State has been gathering similar statistics for Pennsylvania. These reports should not be confused with the present investigation, which in no way concerns the output of sawmills, except in a supplemental capacity. This investigation relates to the rough lumber after it leaves the sawmills and to the bolts and billets after they leave the woods, tracing them through different channels into commodities of final manufacture. It is not the purpose of this study to record the total quantity of wood used annually in the State. Much of it, in the form of rough lumber, goes into construction, which needs no other change than cutting or trimming the timbers, planks, or boards, to fit them into place in the house, bridge, tunnel, concrete forms, scaffolding, fences, etc. This material has not been taken into account and neither have the large quantities of dressed lumber which are brought into the State in the form of flooring, siding and ceiling, finished and ready for use. In addition there are parts of products made in other states and sent into Pennsylvania merely to be assembled; vehicle parts and box shooks are examples; also there are commodities partly manufactured, like club turned handles, spokes, rough bobbins and speeders, chair stock, etc., that have not been included in Pennsylvania but accredited to states in which the principal operations that change the forest material into the finished articles occur.

PURPOSE OF THE STUDY.

The Pennsylvania investigation has been conducted under the same plan as that followed by the Forest Service in 30 other states. Eventually, the information from all the states will be correlated in a national study and a series of publications issued by the Federal Government relating to the wood-using industries and the commercial woods of the United States.

Every factory was asked to state the amount of each species used, the commodity into which each was made, the form in which it was received, and whether these woods came from within Pennsylvania or from outside the State. Inquiries referred also to tendencies of manufacture, closer utilization, and methods followed for waste utilization. As stated above, no data were solicited from sawmills or those producing veneer, laths, shingles, crosssties, cooperage, stock, posts, telegraph poles, chemical wood, pulp wood, etc. This information for all the States has been kept and reported annually by the Bureau of the Census, and such of these statistics as relate to Pennsylvania appear in the appendix of this report; they were taken from the census bulletins issued for 1911-1912. Apart from the concerns producing the above named rough forest products, there are scattered throughout Pennsylvania nearly 5,100 factories that take wood and convert it into articles
of final form. These have been separated into classes or industries, and as much as possible of the data which they represent has been similarly arranged and is presented in this report in tabular form.

The question of the disposal of that part of the rough lumber cut going into the various channels of manufacturer is answered by this report and by the others of this series. For instance, the furniture woods are grouped together in the order of their importance as to amount consumed and in the same way is presented the species demanded for the making of other chief commodities, like chairs, vehicles, refrigerators, matches, farm implements, sporting goods, etc.

The Pennsylvania Department of Forestry and the United States Forest Service are constantly receiving inquiries from points throughout this and nearby states concerning markets for various kinds of timber and lumber, and are called on for data on practical uses of wood and for suggestions and advice on possible solutions of waste problems. This report will answer many of these questions. The farmer, the timber owner, and the sawmill man are aided in selling their material by having the information of the kinds of wood the manufacturers demand and of the forms and prices applying to their purchase. The manufacturers in turn are benefited in these added opportunities for buying raw material and in the suggestions offered for finding in the waste of another factory suitable materials for making their own wares. The report may also suggest to manufacturers possible substitutes of cheaper woods for the more costly ones that are being used, besides pointing out the chief regional sources from which the industries procure their raw material. Dealers in wooden products throughout the country can learn what the Pennsylvania manufacturers have to sell, while those outside of Pennsylvania who desire to dispose of their lumber or wood in other forms can find what the manufacturers demand.

To illustrate the use of this bulletin for reference, suppose information is requested concerning the raw material the handle makers demand. On page 96 appears Table 59, giving the list of handle woods, the prices and amounts of each, and other pertinent information, while in the directory appended to this report, grouped also by industries, appear the names and addresses of the handle manufacturers buying these woods, page 186. Again, suppose information is needed as to what uses are made of ash, with a view of selling to the best advantage. By first turning to the list of uses on pages 145, 146, one can find all commodities made in the State for which the manufacturers demand ash. Should interest be attracted to the use of this wood in the form of lumber, say for passenger cars, by means of the table of contents the industry table embracing prices f. o. b. factory and other data referring to car building material is quickly found. Then by turning to the names of car builders in the directory, all preliminary information is at hand relating to the conditions of marketing this material with the factories engaged in the industry.

FOREST CONDITIONS.

The earliest settlements were naturally in the hardwood regions of the eastern part of the State, where were found extensive forests of various species of oak and hickory. Chestnut, yellow poplar, black walnut, elm, white ash, basswood, and other valuable trees were also common and often attained large size. In the southern tier of counties were magnificent forests, mostly of deciduous growth similar to those in the eastern part of the State. Probably in no region of the United States were there finer hardwoods than here, and magnificent specimens still standing confirm this
presumption and make one realize the almost inconceivable wealth Pennsylvania had in her timber lands. West of the Allegheny River the prevailing timber was largely hardwoods, similar to those in eastern Pennsylvania; but in the central and northeastern parts of the State, in the mountains, is the home of the cone bearing trees, the pine and the hemlock. With these, especially in the northern counties, were associated beech, birches, sugar maple, ashes, the black cherry, and scattered stands of other hardwoods. At first there was an exceedingly limited market for timber, and the gigantic trees that constituted the forests proved a hindrance rather than an asset. The same destructive method of cutting them and rolling the logs together to be burned was pursued in Pennsylvania, with the same zest as in other timbered states. Even the older living citizens recollect the custom of removing timber by fire from ground which was to be used for agricultural pursuits. Farm land was needed above all, but the unabated desire to clear away the timber was not limited to areas suitable for cropping but was extended into thousands of acres that have since been abandoned, after being denuded, as unsuitable for profitable farming.

In the days of the early settlers of Pennsylvania, there was practically no market for hardwoods aside from what was required for local use. In comparison with the demand for softwoods to meet the needs for buildings and other structural purposes, the call for hardwoods was very limited. White pine was then regarded as the principal and only desirable lumber, and was the first in demand when the exploitation of the Pennsylvania forests began. Large rafts of pine logs were floated down the Susquehanna River and its tributaries as these streams drained a region abounding in the growth of this wood. About this period, large quantities of timber were sacrificed for the bark, which was peeled for tanning purposes; the logs being left in the woods to rot and burn. Not long after eastern woods had begun to be felled, similar activities were started in the forests of the far western part of the State. Here the Allegheny and Monongahela Rivers afforded the means of rafting large quantities of timber from that part, which, after being manufactured into lumber, was taken to market by water through the Ohio and Mississippi Rivers. The introduction of railroads extended the lumber industry inland, remote from the rivers, where the finest developed stands of conifers and hardwoods were abundant. After the great demand for white pine had considerably increased its price, hemlock began to attract attention. Though at first considered an inferior lumber, this prejudice soon faded away and Pennsylvania was destined to meet a constantly increasing demand for this species and has since been among the three States leading in hemlock products.

The marketing of the stands of magnificent hardwood forests which had to give way to provide room for agriculture and homes for farmers, was for many years an important economic problem in this State. There was little demand for this kind of timber abroad and still less in any of the other States. This presented the situation that if the hardwoods were to be exploited at all, it would be necessary to develop a market at home, by the establishment of factories like those concerned in this report, which would consume this material for making various manufactured products. These wood-working industries though prosperous, developed gradually at the outset. Later they not only rapidly increased in number, but grew to substantial proportions and contributed largely to the industrial expansion which gave Pennsylvania probably her early recognition as one of the leading manufacturing states. The products turned out by these industries not only
found markets in other states, but were demanded as important articles for export to European cities.

IMPORTANCE OF MANUFACTURING.

Besides the forests, the other natural resources of the State—coal, petroleum, gas, ore, stone, clay, and rich productive soil—have also influenced the starting and growth of particular industries. These resources, with the further advantages Pennsylvania offers through its harbors and waterways, and a network of railway systems, making raw material accessible and products easily marketed, have gained for Pennsylvania a commercial prestige surpassed by only one other state.

In the report of the 13th Census, taken in 1910, the Federal Government shows the valuable farm products taken from Pennsylvania in 1909 to approximate nearly 1663⁄4 million dollars; the value of mineral products, including the output of mines, wells, and quarries, amounted to 2263⁄4 million dollars; while for the same period the factories, 27,563 in number, gave an added value to raw material of nearly 131⁄2 billions dollars. Manufacturing then is preeminently the first of Pennsylvania industries.

The wood-using industries, with which this report deals, constitute one of the important classes of the State's manufacturing enterprises. The value of the commodities turned out by them, together with that of the rough forest products produced, such as crossties, telegraph poles, etc., annually approximate $100,000,000. Although this is small compared to the production of factories using iron and steel, it is next in importance and indicates clearly the part that forests and their affiliated industries have and are still taking in the commercial development of the State. The capitalization of these wood factories amounts to over $63,000,000, and they give employment to nearly 100,000 wage earners, many of whom are skilled mechanics. It is known that the continued operation of these industries depends upon the future timber supply. And equally obvious is the fact that if these factories have to shut down and move closer to other timber producing regions, the result will be general industrial depression and loss.

FUTURE TIMBER SUPPLY.

For more than fifty years lumbering has been actively carried on in Pennsylvania, and has been especially active for the past twenty-five years. Valuable scattered tracts of old growth hemlock and hardwood timber are still to be found in the State, but they represent only a small percentage of its wooded area and before many years pass they will be consumed. It is, therefore, recognized that the second-growth forests will have to be depended upon to meet the demands of the manufacturer, and this can only be made possible by the practice of forestry, according to a definite State-wide policy similar to that which this State has already inaugurated.

Studies by the Pennsylvania Department of Forestry of forest conditions in the State, have pointed out vast areas like that contained in the State forests already established, that are better suited to forest growth than for agriculture. A large portion of these areas has a forest cover of valuable young trees in situations most conducive to their rapid growth. By the same practical and systematic management which is now being followed on the established forests, all of these lands can probably not only maintain the present lumber output of the State, but increase the production in a comparatively short time. In other words, the State, by looking to the future timber supply, can continue her three fold industry of growing timber, cutting it into lumber, and making it into commodities.
SCOPe OF THE STUDY.

This report is divided into three parts. Part I relates to the species of wood used by the wood-working factories in Pennsylvania, independent of their particular uses and the factories purchasing them. There is a general discussion of each wood, its range, and importance in the State as a lumber tree, the proportion of the amount used grown within the State, and a brief though particular enumeration of the properties of the wood. Uses are referred to only in a general sense by calling attention to the industries reporting the wood in large quantities.

Part II concerns the wood-using factories of Pennsylvania which have been divided into industries according to products manufactured. Following this is a discussion of individual industries, referring to the products manufactured, processes of manufacturing, woods demanded, and the principal qualities determining their use. In a majority of cases, the most suitable wood for each particular purpose is known, but the second best of the available kinds is pointed out where possible, and in this way, as well as in others previously mentioned, the report will prove valuable to wood users.

Part III is a summary of wood uses, independent of any industry classification or statistical data. In compiling this list, the Forest Service endeavored to arrange it to include every wooden commodity manufactured in Pennsylvania. It constitutes the most nearly complete compendium of uses of wood that has ever been arranged, and will be of particular value for reference. Part III further includes the directory of the names and addresses of manufacturers, grouped according to industries, who supplied the information contained in this report. The appendix presents data pertaining to Pennsylvania taken from reports of the Bureau of Census, United States Department of Commerce.
PART I.

KINDS OF WOOD.

A summary of the kinds of wood consumed in Pennsylvania manufacture, together with the cost, total quantity, and average price are presented in Table I following. Seventy-two kinds of wood were used within the State in the year 1911-12. White pine heads the list, representing nearly 14½% of the total, but had longleaf, loblolly, and shortleaf pine been grouped under the term "southern yellow pine" it would have stood first in the list, and in amount equal to more than ½ of the total consumption.

It is interesting to know that the consumption of lumber in Pennsylvania exceeds the production. In 1912 the lumber cut by the State was 992,180,000 feet while the quantity consumed by the wood-using factories was 1,114,000,000 feet. Of the quantity used, 313,683,000 feet or 28% was accredited to the State, leaving 800,536,000 feet as coming from the forests of other States and from foreign countries. Cost is the principal consideration with the manufacturer purchasing raw material and the fact that his own State produces the same kind of lumber that he uses is of little consideration unless that material be the cheapest and readily and conveniently procured. That only a little more than one-fourth of the State's lumber production is consumed in factories within the State suggests a probable duplication in distribution that does not tend to economy. This condition is worthy of consideration by both lumber consumers and lumber producers, and when generally understood, can, through the medium of the regular trade agencies, be considerably improved.

So far as possible in this study, the data were presented by species rather than by genus in order to enable one more easily to study uses according to inherent properties. It is of far greater value to know that a wood is white oak, yellow poplar, or sugar maple than to have merely the generic name, oak, poplar, or maple. Owing to the many difficulties encountered this effort was but partially successful and was followed only to the extent warranted by the information furnished by the manufacturers and by general information as the particular uses of woods or the location where they were cut.

The southern states, and next to them the Lake states, contribute more of the shipped-in material than any other lumber producing region. Shipments of white pine, sugar maple, beech, birch, ash and elm were reported as originating in the Lake region. The largest part of the shipped-in supply of oak, yellow poplar, hickory, chestnut, and sycamore came from the forests of West Virginia, Maryland, Kentucky, and Tennessee, included within the hardwood region. Canada contributed a larger amount of wood but not as many kinds as the region embracing New York and the New England states, while the Pacific coast states sent a supply of six woods that aggregated nearly 10,000,000 feet. That such a large amount should have been brought over so great a distance to meet the demands of the Pennsylvania wood-users is significant of the growing scarcity of native eastern soft-woods.
<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Quantity Used</th>
<th>Total cost 10,000 ft. at</th>
<th>Cost per 1,000 ft. at</th>
<th>Per cent</th>
<th>Average cost per 1,000 ft. at</th>
<th>Total cost 100,000 ft. at</th>
<th>Foot b. m.</th>
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<td>White pine</td>
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<td>Pinus echinata</td>
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<td>12.14</td>
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<td>Longleaf pine</td>
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<td>Fagus grandifolia</td>
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<td>Taxodium distichum</td>
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<td>Red cedar</td>
<td>Juniperus virginiana</td>
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<td>Western hemlock</td>
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<td>Cucumber</td>
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<td>Yellow buckeye</td>
<td>Arceplus odorata</td>
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<td>Applewood</td>
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<td>6,878</td>
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<td>Persimmon</td>
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<td>0.01</td>
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<td>Circassian walnut</td>
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<td>French hiar</td>
<td>Eucalyptus species</td>
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<td>0.01</td>
<td>531.34</td>
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<td>Teak</td>
<td>Eucalyptus grandis</td>
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Table 1.—Summary of kinds of wood used in Pennsylvania, year ending June, 1912—Continued.

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<tr>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Quantity Used</th>
<th>Per cent</th>
<th>Average cost per 1,000 ft. at factory</th>
<th>Total cost f. o. b. factory</th>
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<td>Tamarnck,</td>
<td>Larix laricina,</td>
<td>40,300</td>
<td>*</td>
<td>28.81</td>
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<tr>
<td>Balsam fir,</td>
<td>Abies balsamea,</td>
<td>40,000</td>
<td>*</td>
<td>45.50</td>
<td>1,830</td>
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<td>Boxwood,</td>
<td>Tilia pentaphylla and Buxus sempervirens</td>
<td>22,416</td>
<td>*</td>
<td>296.90</td>
<td>6,589</td>
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<tr>
<td>Aspen (popple),</td>
<td>Populus tremuloides</td>
<td>20,000</td>
<td>*</td>
<td>15.00</td>
<td>450</td>
</tr>
<tr>
<td>Willow (black),</td>
<td>salix nigra</td>
<td>15,000</td>
<td>*</td>
<td>19.09</td>
<td>294</td>
</tr>
<tr>
<td>Sitka spruce</td>
<td>Picea sitchensis</td>
<td>15,000</td>
<td>*</td>
<td>35.49</td>
<td>531</td>
</tr>
<tr>
<td>Rosewood</td>
<td>Dalbergia species</td>
<td>6,185</td>
<td>*</td>
<td>462.89</td>
<td>2,863</td>
</tr>
<tr>
<td>Eucalyptus</td>
<td>Eucalyptus species</td>
<td>5,000</td>
<td>*</td>
<td>320.00</td>
<td>1,300</td>
</tr>
<tr>
<td>Lignum-vitae</td>
<td>Gomphocarpus officinalis</td>
<td>2,050</td>
<td>*</td>
<td>175.61</td>
<td>359</td>
</tr>
<tr>
<td>Mountain laurel,</td>
<td>Kalina latifolia</td>
<td>1,000</td>
<td>*</td>
<td>40.09</td>
<td>40</td>
</tr>
<tr>
<td>Sumach</td>
<td>Rhus hirta (R. typhina)</td>
<td>500</td>
<td>*</td>
<td>50.00</td>
<td>40</td>
</tr>
<tr>
<td>Olive wood</td>
<td>Olea europaea</td>
<td>450</td>
<td>*</td>
<td>82.21</td>
<td>38</td>
</tr>
<tr>
<td>Satinwood</td>
<td>Chloroxylon swietenia</td>
<td>120</td>
<td>*</td>
<td>200.00</td>
<td>24</td>
</tr>
<tr>
<td>Sassafras</td>
<td>Sassafras (S. vartifolium)</td>
<td>50</td>
<td>*</td>
<td>35.00</td>
<td>1</td>
</tr>
<tr>
<td>Welches roots,</td>
<td>Puccus mahalob</td>
<td>30</td>
<td>*</td>
<td>540.00</td>
<td>16</td>
</tr>
<tr>
<td>Sarbo</td>
<td></td>
<td>30</td>
<td>*</td>
<td>300.00</td>
<td>6</td>
</tr>
<tr>
<td>Doncella</td>
<td>Byrsonima sapoica</td>
<td>10</td>
<td>*</td>
<td>100.00</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1,114,219,659</td>
<td>100.00</td>
<td>$29.15</td>
<td>$24,482,227</td>
</tr>
</tbody>
</table>

Reeds, ..................24,000 lbs.
Rattan, ..................2,000 lbs.
*a*Less than 1-1/20 of 1 per cent.

Under the heading "Kind of Wood" the above table shows two separate lists of names. In the first column appear the names of the several woods as they are known to the trade, called common names. The scientific names which the botanists use to distinguish species are shown in the second column. In this and similar State reports, it has been the purpose of the Forest Service to call woods by their proper name with a view of standardizing nomenclature. Common names vary considerably according to locality but botanists as a rule are in agreement as to the scientific names. There are exceptions to this and among those shown in the above table are hickory, beech, locust, and sassafras. It will be noted that two botanical names are given for these woods. The first set is used by the Forest Service as given in the publication issued by the Federal Government entitled "The Check List of the Forest Trees of the United States." The second set is from the seventh edition of Gray’s Botany which is used as a standard by the Pennsylvania Department of Forestry.

Thirteen of the species shown in the above table are foreign woods, the most prominent being Spanish cedar, and mahogany, followed by ebony and teak. Those accustomed to purchasing foreign woods in the form of logs, fitches, or lumber may regard the average cost of these woods as excessive. This is because a part of the supply of these woods is purchased in the form of thin veneer which, in order to be included in the tables of this report, was reduced to feet board measure with no allowance for waste or the cost of production.
THE WOODS GROWN IN PENNSYLVANIA.

Of the seventy-two woods which the manufacturers reported using, the entire amount of only six was home grown. These were aspen, (or popple), mountain laurel, sometimes called kalmia, black locust, sassafras, sumach and willow. The forests in the State also furnished a part of the supply of thirty-six other woods, making an aggregate of State-grown material used equal to a little more than 28% of the total consumption.

Instead of arranging the woods in the order of the quantity consumed, as in Table 1, they are shown in Table 2 alphabetically according to their generic names. This arrangement throws together consecutively the birches, the cedars, the oaks, the maples, and the pines, and allows an easy comparison of amounts of each species used, and if desired, an aggregate of any of them can be made readily. For a more convenient comparison of the homeguarded woods with those grown out of the State, not only the quantities of these two classes are given for each species but also the per cent. which each class represents.

Table 2.—Summary of State-grown and shipped-in wood used in Pennsylvania, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity, Feet b. m.</td>
<td>Per cent.</td>
</tr>
<tr>
<td>Applewood</td>
<td>87,435</td>
<td>56.71</td>
</tr>
<tr>
<td>Ash</td>
<td>6,966,862</td>
<td>45.52</td>
</tr>
<tr>
<td>Aspen (popple)</td>
<td>30,600</td>
<td>100.00</td>
</tr>
<tr>
<td>Balsam fir</td>
<td>7,933,764</td>
<td>42.49</td>
</tr>
<tr>
<td>Beech</td>
<td>27,556,966</td>
<td>65.47</td>
</tr>
<tr>
<td>Birch</td>
<td>3,829,047</td>
<td>52.73</td>
</tr>
<tr>
<td>Boxwood</td>
<td>32,410</td>
<td>100.00</td>
</tr>
<tr>
<td>Buckeye, yellow</td>
<td>154,000</td>
<td>56.76</td>
</tr>
<tr>
<td>Butternut</td>
<td>79,500</td>
<td>91.58</td>
</tr>
<tr>
<td>Cedar, red</td>
<td>17,569</td>
<td>1.89</td>
</tr>
<tr>
<td>Cedar, southern white</td>
<td>3,725,300</td>
<td>100.00</td>
</tr>
<tr>
<td>Cedar, western red</td>
<td>55,000</td>
<td>100.00</td>
</tr>
<tr>
<td>Cherry, black</td>
<td>1,592,588</td>
<td>60.30</td>
</tr>
<tr>
<td>Chestnut</td>
<td>22,479,339</td>
<td>43.80</td>
</tr>
<tr>
<td>Congo</td>
<td>66,000</td>
<td>100.00</td>
</tr>
<tr>
<td>Cottonwood</td>
<td>16,670,900</td>
<td>1.46</td>
</tr>
<tr>
<td>Cucumber</td>
<td>153,000</td>
<td>67.05</td>
</tr>
<tr>
<td>Cypress (bald)</td>
<td>23,195,290</td>
<td>100.00</td>
</tr>
<tr>
<td>Dogwood</td>
<td>1,130,128</td>
<td>85.37</td>
</tr>
<tr>
<td>Doncella</td>
<td>10</td>
<td>100.00</td>
</tr>
<tr>
<td>Douglas fir</td>
<td>3,365,125</td>
<td>100.00</td>
</tr>
<tr>
<td>Ebony</td>
<td>134,777</td>
<td>100.00</td>
</tr>
<tr>
<td>Elm, cork</td>
<td>517,600</td>
<td>77.00</td>
</tr>
<tr>
<td>Elm, white</td>
<td>8,862,348</td>
<td>91.23</td>
</tr>
<tr>
<td>Eucalyptus</td>
<td>5,000</td>
<td>100.00</td>
</tr>
<tr>
<td>French briar</td>
<td>81,300</td>
<td>100.00</td>
</tr>
<tr>
<td>Gum, black</td>
<td>4,854,444</td>
<td>98.98</td>
</tr>
<tr>
<td>Gum, cotton</td>
<td>5,057,887</td>
<td>100.00</td>
</tr>
<tr>
<td>Hemlock</td>
<td>11,369,360</td>
<td>27.45</td>
</tr>
<tr>
<td>Hemlock, western</td>
<td>500,000</td>
<td>100.00</td>
</tr>
<tr>
<td>Hickory</td>
<td>9,485,659</td>
<td>38.13</td>
</tr>
<tr>
<td>Holly, Americana</td>
<td>61,000</td>
<td>100.00</td>
</tr>
<tr>
<td>Hornbeam</td>
<td>397,184</td>
<td>72.59</td>
</tr>
<tr>
<td>Laurel, mountain</td>
<td>1,000</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Table 2.—Summary of State-grown and shipped-in wood used in Pennsylvania, year ending June, 1912—Continued.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Grown in Pennsylvania</th>
<th></th>
<th>Grown Out of Pennsylvania</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity Feet b. m.</td>
<td>Per cent.</td>
<td>Quantity Feet b. m.</td>
<td>Per cent.</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>-----------------------</td>
<td>----------</td>
<td>---------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Lignum vitae,</td>
<td>855,836</td>
<td>100.00</td>
<td>2,060</td>
<td>100.00</td>
</tr>
<tr>
<td>Locust, black,</td>
<td>9,830</td>
<td>100.00</td>
<td>5,800</td>
<td>100.00</td>
</tr>
<tr>
<td>Mahogany,</td>
<td>3,078,375</td>
<td>33.41</td>
<td>2,088,400</td>
<td>40.19</td>
</tr>
<tr>
<td>Maple, redbay,</td>
<td>35,482,286</td>
<td>41.58</td>
<td>19,478,665</td>
<td>38.41</td>
</tr>
<tr>
<td>Oak, redbay,</td>
<td>25,681,326</td>
<td>30.96</td>
<td>58,156,208</td>
<td>62.87</td>
</tr>
<tr>
<td>Oak, white,</td>
<td>41,859,474</td>
<td>48.88</td>
<td>56,823,721</td>
<td>57.76</td>
</tr>
<tr>
<td>Pines, loblolly</td>
<td>115,010</td>
<td>100.00</td>
<td>51,241,344</td>
<td>100.00</td>
</tr>
<tr>
<td>Pine, longleaf</td>
<td>100,000</td>
<td>100.00</td>
<td>100,000</td>
<td>100.00</td>
</tr>
<tr>
<td>Pine, Norway,</td>
<td>25,000</td>
<td>100.00</td>
<td>2,300,740</td>
<td>100.00</td>
</tr>
<tr>
<td>Pine, pitch,</td>
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<td>11.09</td>
<td>6,188,500</td>
<td>58.31</td>
</tr>
<tr>
<td>Pine, scarb</td>
<td>105,904</td>
<td>4.43</td>
<td>1,250,065</td>
<td>85.38</td>
</tr>
<tr>
<td>Pine, shortleaf</td>
<td>10,000</td>
<td>0.41</td>
<td>145,734,215</td>
<td>99.59</td>
</tr>
<tr>
<td>Pine, sugar,</td>
<td>2,123,700</td>
<td>100.00</td>
<td>2,123,700</td>
<td>100.00</td>
</tr>
<tr>
<td>Pine, western white</td>
<td>9,570,500</td>
<td>100.00</td>
<td>5,620,500</td>
<td>100.00</td>
</tr>
<tr>
<td>Pine, western yellow</td>
<td>830,000</td>
<td>100.00</td>
<td>830,000</td>
<td>100.00</td>
</tr>
<tr>
<td>Pine, white,</td>
<td>119,286,764</td>
<td>43.07</td>
<td>91,312,955</td>
<td>56.93</td>
</tr>
<tr>
<td>Red gum,</td>
<td>5,500</td>
<td>0.22</td>
<td>24,350,644</td>
<td>99.78</td>
</tr>
<tr>
<td>Redwood</td>
<td>506,682</td>
<td>100.00</td>
<td>506,682</td>
<td>100.00</td>
</tr>
<tr>
<td>Rosewood</td>
<td>6,185</td>
<td>100.00</td>
<td>6,185</td>
<td>100.00</td>
</tr>
<tr>
<td>Sassafras,</td>
<td>50</td>
<td>100.00</td>
<td>50</td>
<td>100.00</td>
</tr>
<tr>
<td>Satinwood</td>
<td>120</td>
<td>100.00</td>
<td>120</td>
<td>100.00</td>
</tr>
<tr>
<td>Sabo,</td>
<td>30</td>
<td>100.00</td>
<td>30</td>
<td>100.00</td>
</tr>
<tr>
<td>Spanish cedar,</td>
<td>5,812,600</td>
<td>100.00</td>
<td>5,812,600</td>
<td>100.00</td>
</tr>
<tr>
<td>Spruce,</td>
<td>1,736,499</td>
<td>8.79</td>
<td>18,752,628</td>
<td>91.30</td>
</tr>
<tr>
<td>Spruce, Sitka</td>
<td>15,900</td>
<td>100.00</td>
<td>15,900</td>
<td>100.00</td>
</tr>
<tr>
<td>Sumach</td>
<td>300</td>
<td>100.00</td>
<td>300</td>
<td>100.00</td>
</tr>
<tr>
<td>Sycamore</td>
<td>21,068</td>
<td>4.55</td>
<td>656,470</td>
<td>95.45</td>
</tr>
<tr>
<td>Tamarack,</td>
<td>300</td>
<td>0.74</td>
<td>40,090</td>
<td>99.26</td>
</tr>
<tr>
<td>Teak,</td>
<td>65,580</td>
<td>100.00</td>
<td>65,580</td>
<td>100.00</td>
</tr>
<tr>
<td>Walnut, black</td>
<td>335,040</td>
<td>56.70</td>
<td>235,040</td>
<td>43.30</td>
</tr>
<tr>
<td>Walnut, Circassian</td>
<td>105,140</td>
<td>100.00</td>
<td>105,140</td>
<td>100.00</td>
</tr>
<tr>
<td>Whiteoak roots,</td>
<td>30</td>
<td>100.00</td>
<td>30</td>
<td>100.00</td>
</tr>
<tr>
<td>Willow, black</td>
<td>25,900</td>
<td>100.00</td>
<td>25,900</td>
<td>100.00</td>
</tr>
<tr>
<td>Yellow poplar,</td>
<td>13,013,363</td>
<td>22.91</td>
<td>38,767,355</td>
<td>77.09</td>
</tr>
<tr>
<td>Total</td>
<td>312,683,638</td>
<td>29.35</td>
<td>869,586,018</td>
<td>70.65</td>
</tr>
</tbody>
</table>

SPECIFIC DESCRIPTIONS.

Notwithstanding the very general substitution of other materials like concrete, metals, stone, and clay for wood there is no clear indication that the call for lumber and other forest products is decreasing at this time. With the opening of the Panama Canal and the changing conditions which are constantly taking place in trade, it is difficult to predict what the future will bring forth. As it is there is a large demand for lumber of all kinds and especially for the better grades of native woods. If there were an inexhaustible supply of timber now as there appeared to be fifty years or more ago, there would be less reason for making a study of this kind: but on account of the growing shortage of commercial timber it is most important that investigations be made to determine the qualities of woods that best fit them for a particular use. With this in view, this section of the report has been devoted to a brief account of the several woods used by the manufacturers.
In dealing with the properties of woods in the following paragraphs, a graded set of terms, such as hard, very hard, fairly hard, soft, very soft, etc., is used. These terms of course indicate an approximate scale and apply only to the average run of woods, as many conditions governing the growth of the tree affect materially the structure of the wood so that the same kind appears to have slightly different qualities. Generally the scale of terms used will serve to give a fairly clear idea of the properties of woods. To prevent confusion in their application, efforts have been made not to use them too loosely. The schedule setting forth the terms showing the relative gradations to which all descriptions of qualities conform will be found on page 60. By reference to this schedule the properties of the woods described may readily be studied and compared.

Lumbermen divide woods into two general classes, hardwoods and softwoods. This classification is not based so much upon the qualities of hardness and softness as upon distinction which custom has standardized because it is practical and holds true generally. Hardwoods are trees with broad leaves, while the softwoods have the needle leaf.

THE SOFTWOODS.

There are nineteen species of conifers going into final manufacture in Pennsylvania. Ten of them are pines, constituting nearly fifty per cent. of the total consumption, and of these the supply of seven is obtained entirely from other states, and of the three home-grown species, scrub and pitch pine are required in relatively small amounts, leaving white pine the foremost softwood representative of the Pennsylvania forests. Pine lumber is generally admitted to be the most valuable wood that the earth produces and the species that are used in Pennsylvania together with the other softwoods are described in the order of quantity as follows:

PINES.

White Pine (*Pinus Strobus*).

White pine was the first lumber tree in Pennsylvania that attracted the attention of the lumbermen. It was not found in this State in thick stands of vast areas like the white pine in the Lake regions and parts of New England, but it grew plentifully in various parts of the State. The trees were generally of large development, and in the early years of lumbering, Pennsylvania trees contributed a large proportion of the total white pine cut of the country. In 1880 the estimated cut of white pine in Pennsylvania amounted to 350,000,000 feet, in 1900, 221,000,000 feet, and in 1910 only 92,000,000 feet. In a few localities the remnants of the original stands are still being cut and here and there trees are found scattered among the hemlocks and hardwoods, besides the second growth that helps to make up the supply. White pine reproduces vigorously and in certain parts of the State under favorable conditions grows with astonishing rapidity. In quantity, it is the most used of any wood for manufacture in Pennsylvania, and owing to its valuable qualities of being light, soft, comparatively durable, of whitish color, easily worked, and holding its shape when in place, it is called for by the factories comprising thirty-two of the fifty-four industries. The largest quantity was used for making planing mill products and general mill work, and the next largest for boxes, these two industries accounting for 71% of the supply going to the Pennsylvania factories. It is interesting to note that white pine cut for Pennsylvania was only 2,000,000 feet more than the reported quantity of home-grown wood used. This gives white pine the distinction of being con-
Table 3.—Consumption of White Pine, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity.</th>
<th>Per cent.</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost at factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td></td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planing mill products</td>
<td>62,556,492</td>
<td>19.98</td>
<td>$36.58</td>
<td>$2,325,527</td>
<td>33,281,260</td>
<td>33,295,193</td>
</tr>
<tr>
<td>Boxes and crates, packing</td>
<td>51,583,873</td>
<td>16.59</td>
<td>21.63</td>
<td>1,081,744</td>
<td>13,040,373</td>
<td>33,133,000</td>
</tr>
<tr>
<td>Car construction</td>
<td>13,329,439</td>
<td>4.38</td>
<td>46.67</td>
<td>618,738</td>
<td>2,276,188</td>
<td>6,880,251</td>
</tr>
<tr>
<td>Patterns and Masks</td>
<td>9,111,449</td>
<td>2.83</td>
<td>56.69</td>
<td>512,735</td>
<td>763,580</td>
<td>4,095,500</td>
</tr>
<tr>
<td>Caskets and coffins</td>
<td>4,717,953</td>
<td>1.51</td>
<td>18.90</td>
<td>85,956</td>
<td>135,836</td>
<td></td>
</tr>
<tr>
<td>Ship and boat building</td>
<td>4,344,650</td>
<td>1.39</td>
<td>43.85</td>
<td>212,308</td>
<td>2,733,150</td>
<td>1,811,500</td>
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<tr>
<td>Pumps</td>
<td>2,052,989</td>
<td>0.64</td>
<td>24.39</td>
<td>51,435</td>
<td>1,576,900</td>
<td>517,000</td>
</tr>
<tr>
<td>Boats</td>
<td>1,991,600</td>
<td>0.64</td>
<td>32.00</td>
<td>62,900</td>
<td></td>
<td>1,090,600</td>
</tr>
<tr>
<td>Tanks and silos</td>
<td>820,600</td>
<td>0.28</td>
<td>23.44</td>
<td>75,570</td>
<td>60,000</td>
<td>795,000</td>
</tr>
<tr>
<td>Machinery and apparatus, electrical</td>
<td>787,500</td>
<td>0.25</td>
<td>14.92</td>
<td>115,000</td>
<td>387,250</td>
<td></td>
</tr>
<tr>
<td>Toys</td>
<td>715,500</td>
<td>0.23</td>
<td>29.60</td>
<td>21,650</td>
<td>438,750</td>
<td>227,500</td>
</tr>
<tr>
<td>Fixtures</td>
<td>435,450</td>
<td>1.42</td>
<td>46.64</td>
<td>20,434</td>
<td>100,450</td>
<td>352,000</td>
</tr>
<tr>
<td>Trunks and valleys</td>
<td>425,500</td>
<td>1.35</td>
<td>28.60</td>
<td>12,355</td>
<td>128,500</td>
<td>360,000</td>
</tr>
<tr>
<td>Furniture</td>
<td>386,000</td>
<td>1.23</td>
<td>41.32</td>
<td>15,228</td>
<td>283,500</td>
<td>17,200</td>
</tr>
<tr>
<td>Mine equipment</td>
<td>336,000</td>
<td>1.09</td>
<td>23.70</td>
<td>5,065</td>
<td>15,000</td>
<td>230,000</td>
</tr>
<tr>
<td>Baskets, fruit and vegetables</td>
<td>220,000</td>
<td>0.70</td>
<td>21.90</td>
<td>4,820</td>
<td>220,000</td>
<td></td>
</tr>
<tr>
<td>Woodeware and novelties</td>
<td>225,000</td>
<td>0.71</td>
<td>11.78</td>
<td>2,650</td>
<td>225,000</td>
<td></td>
</tr>
<tr>
<td>Butcher's blocks and skewers</td>
<td>206,000</td>
<td>0.65</td>
<td>29.40</td>
<td>6,900</td>
<td>206,000</td>
<td></td>
</tr>
<tr>
<td>Machine construction</td>
<td>142,500</td>
<td>0.45</td>
<td>41.24</td>
<td>5,932</td>
<td>85,500</td>
<td>50,000</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>140,550</td>
<td>0.44</td>
<td>34.62</td>
<td>4,866</td>
<td>118,450</td>
<td>23,500</td>
</tr>
<tr>
<td>Agricultural implements</td>
<td>116,000</td>
<td>0.37</td>
<td>31.71</td>
<td>2,878</td>
<td>26,600</td>
<td>90,000</td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>88,000</td>
<td>0.28</td>
<td>34.56</td>
<td>3,041</td>
<td>88,000</td>
<td></td>
</tr>
<tr>
<td>Dairymen's, poulterers' and apothecary's supplies</td>
<td>79,000</td>
<td>0.25</td>
<td>23.59</td>
<td>1,784</td>
<td>15,000</td>
<td>61,000</td>
</tr>
<tr>
<td>Laundry appliances</td>
<td>78,200</td>
<td>0.25</td>
<td>37.92</td>
<td>2,880</td>
<td>25,000</td>
<td>58,200</td>
</tr>
<tr>
<td>Excelsior</td>
<td>63,500</td>
<td>0.20</td>
<td>15.60</td>
<td>933</td>
<td>63,500</td>
<td></td>
</tr>
<tr>
<td>Elevators</td>
<td>82,200</td>
<td>0.26</td>
<td>40.45</td>
<td>2,536</td>
<td>32,300</td>
<td>30,000</td>
</tr>
<tr>
<td>Manual training practice (skylj)</td>
<td>21,650</td>
<td>0.07</td>
<td>27.35</td>
<td>1,581</td>
<td>5,670</td>
<td>12,500</td>
</tr>
<tr>
<td>Gates and fencing</td>
<td>5,050</td>
<td>0.02</td>
<td>26.60</td>
<td>1,050</td>
<td>6,000</td>
<td></td>
</tr>
<tr>
<td>Plumbers' woodwork</td>
<td>2,500</td>
<td>0.08</td>
<td>36.00</td>
<td>90</td>
<td>2,500</td>
<td></td>
</tr>
<tr>
<td>Instruments', professional and scientific</td>
<td>1,000</td>
<td>0.03</td>
<td>90.00</td>
<td>90</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Refrigerators and kitchen cabinets</td>
<td>500</td>
<td></td>
<td>28.60</td>
<td>14</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>7,692,000</td>
<td>2.46</td>
<td>25.00</td>
<td>182,670</td>
<td>7,692,000</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>160,749,739</td>
<td>52.00</td>
<td><strong>$35.55</strong></td>
<td><strong>$6,071,607</strong></td>
<td><strong>68,230,761</strong></td>
<td><strong>91,512,905</strong></td>
</tr>
</tbody>
</table>

*Less than 1/100 of 1 per cent.

**Shortleaf Pine (Pinus echinata).**

In quantity shortleaf pine is the most important yellow pine used by the Pennsylvania wood users. It was demanded, next to white pine, in the largest amount of any wood going into final manufacture in the State. Twenty-four industries report using this wood, but over ninety-one per cent. of the total went to three of them: boxes, planing mill products, and car construction. Shortleaf pine grows in Pennsylvania and, to a limited extent, is sawed into lumber; but the manufacturers report the use of the home cut wood in very small quantities and purchase almost their entire supply in the southern states. Shortleaf pine is a soft, yellow wood with considerable sap and has wider rings than the longleaf pine. Its qualities may be indicated.
as intermediate or coarse grained, moderately hard, dense, tough and elastic, strong, stiff, durable, resinous, moderately stable, rather easy to work, and takes paint well. It is not infrequently bought and sold as longleaf pine, especially that coming from the Gulf states. The Virginia and Carolina shortleaf pine is generally handled under the name North Carolina pine, being a mixture of lobolly and shortleaf in the proportion of about four to one.

Table 4.—Consumption of Shortleaf Pine, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Feet b. m.</th>
<th>Per cent.</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost c. b. factory.</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boxes and crates, packing</td>
<td>52,719,727</td>
<td>35.21</td>
<td>8.95 00</td>
<td>$919,092</td>
<td>52,719,727</td>
<td>95,000</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>51,870,590</td>
<td>34.64</td>
<td>26.68</td>
<td>1,387,738</td>
<td>51,870,590</td>
<td>32,724,334</td>
</tr>
<tr>
<td>Car construction</td>
<td>32,724,334</td>
<td>21.85</td>
<td>26.30</td>
<td>834,365</td>
<td>32,724,334</td>
<td>8,000,000</td>
</tr>
<tr>
<td>Boards, cloth, hosery, etc.</td>
<td>7,600,000</td>
<td>5.34</td>
<td>23.00</td>
<td>350,000</td>
<td>7,600,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Machinery and electrical apparatus</td>
<td>968,200</td>
<td>0.65</td>
<td>21.09</td>
<td>21,91</td>
<td>968,200</td>
<td></td>
</tr>
<tr>
<td>Mine equipment</td>
<td>567,000</td>
<td>0.36</td>
<td>21.14</td>
<td>11,983</td>
<td>567,000</td>
<td></td>
</tr>
<tr>
<td>Ship and boat building</td>
<td>450,000</td>
<td>0.22</td>
<td>20.74</td>
<td>12,320</td>
<td>450,000</td>
<td></td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>467,000</td>
<td>0.31</td>
<td>26.67</td>
<td>12,161</td>
<td>467,000</td>
<td></td>
</tr>
<tr>
<td>Refrigerators and kitchen cabinets</td>
<td>435,750</td>
<td>0.29</td>
<td>27.67</td>
<td>12,284</td>
<td>435,750</td>
<td></td>
</tr>
<tr>
<td>Fixtures</td>
<td>216,000</td>
<td>0.17</td>
<td>32.92</td>
<td>6,625</td>
<td>216,000</td>
<td></td>
</tr>
<tr>
<td>Patterns and flasks</td>
<td>224,023</td>
<td>0.16</td>
<td>29.90</td>
<td>5,966</td>
<td>224,023</td>
<td></td>
</tr>
<tr>
<td>Equipment, playground</td>
<td>216,000</td>
<td>0.16</td>
<td>27.00</td>
<td>6,480</td>
<td>216,000</td>
<td></td>
</tr>
<tr>
<td>Machine construction</td>
<td>162,000</td>
<td>0.11</td>
<td>23.95</td>
<td>3,310</td>
<td>162,000</td>
<td></td>
</tr>
<tr>
<td>Dairymen's, poulterers', etc.</td>
<td>140,000</td>
<td>0.10</td>
<td>23.63</td>
<td>2,255</td>
<td>140,000</td>
<td></td>
</tr>
<tr>
<td>Furniture</td>
<td>140,000</td>
<td>0.10</td>
<td>23.92</td>
<td>3,374</td>
<td>140,000</td>
<td></td>
</tr>
<tr>
<td>Agricultural implements</td>
<td>140,000</td>
<td>0.10</td>
<td>23.92</td>
<td>3,374</td>
<td>140,000</td>
<td></td>
</tr>
<tr>
<td>Tanks and silos</td>
<td>253,000</td>
<td>0.16</td>
<td>29.74</td>
<td>3,825</td>
<td>253,000</td>
<td></td>
</tr>
<tr>
<td>Elevators</td>
<td>135,000</td>
<td>0.08</td>
<td>23.99</td>
<td>1,600</td>
<td>135,000</td>
<td></td>
</tr>
<tr>
<td>Ladders</td>
<td>12,250</td>
<td>0.01</td>
<td>23.99</td>
<td>500</td>
<td>12,250</td>
<td></td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>19,900</td>
<td>0.01</td>
<td>34.52</td>
<td>687</td>
<td>19,900</td>
<td></td>
</tr>
<tr>
<td>Plumbers' woodwork</td>
<td>12,000</td>
<td>0.01</td>
<td>28.00</td>
<td>343</td>
<td>12,000</td>
<td></td>
</tr>
<tr>
<td>Handles</td>
<td>12,000</td>
<td>0.01</td>
<td>30.00</td>
<td>350</td>
<td>12,000</td>
<td></td>
</tr>
<tr>
<td>Frames and molding, picture, etc.</td>
<td>5,000</td>
<td>0.00</td>
<td>30.00</td>
<td>150</td>
<td>5,000</td>
<td></td>
</tr>
<tr>
<td>Manual training practice (sloyd)</td>
<td>250</td>
<td>0.00</td>
<td>49.00</td>
<td>10</td>
<td>250</td>
<td></td>
</tr>
</tbody>
</table>

| Total | 149,741,313 | 100.00 | 813.34 | $3,494,350 | 10,000 | 149,734,313 |

*Less than 1-100 of 1 per cent.

**Longleaf Pine (Pinus palustris).**

For strength, stiffness, and durability, longleaf pine is considered superior to other species of yellow pine. The distinguishing features of the wood are its narrow rings and its relatively small proportion of sapwood. It is hard, with fine straight grain, dense, moderately heavy, elastic, tough; splits rather easily, is fairly hard to work, and does not take paint well. Nearly three-fourths of all that is used in the State is consumed in car building, although seventeen other industries reported its use in varying small amounts. The most prominent among these are planing mill products, ship building, and the manufacture of tanks and silos.
Table 5.—Consumption of Longleaf Pine, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Per cent.</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car construction</td>
<td>76,922,160</td>
<td>70.85</td>
<td>$82.23</td>
<td>$7,477,685</td>
<td>56,932,160</td>
<td>56,932,160</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>19,612,568</td>
<td>18.06</td>
<td>29.28</td>
<td>576,370</td>
<td>19,612,568</td>
<td>19,612,568</td>
</tr>
<tr>
<td>Ship and boat building</td>
<td>5,386,000</td>
<td>4.87</td>
<td>35.56</td>
<td>189,520</td>
<td>5,386,000</td>
<td>5,386,000</td>
</tr>
<tr>
<td>Tanks and silos</td>
<td>2,665,000</td>
<td>2.46</td>
<td>26.57</td>
<td>68,150</td>
<td>2,665,000</td>
<td>2,665,000</td>
</tr>
<tr>
<td>Machine construction</td>
<td>1,431,000</td>
<td>1.32</td>
<td>27.66</td>
<td>39,550</td>
<td>1,431,000</td>
<td>1,431,000</td>
</tr>
<tr>
<td>Vehiciles and vehicle parts</td>
<td>575,570</td>
<td>0.52</td>
<td>24.33</td>
<td>19,291</td>
<td>575,570</td>
<td>575,570</td>
</tr>
<tr>
<td>Agricultural implements</td>
<td>508,200</td>
<td>0.47</td>
<td>23.77</td>
<td>17,880</td>
<td>508,200</td>
<td>508,200</td>
</tr>
<tr>
<td>Mine equipment</td>
<td>433,500</td>
<td>0.39</td>
<td>25.39</td>
<td>11,163</td>
<td>433,500</td>
<td>433,500</td>
</tr>
<tr>
<td>Elevators</td>
<td>391,300</td>
<td>0.35</td>
<td>26.73</td>
<td>9,913</td>
<td>391,300</td>
<td>391,300</td>
</tr>
<tr>
<td>Boxes and crates, packing</td>
<td>241,800</td>
<td>0.22</td>
<td>23.04</td>
<td>5,330</td>
<td>241,800</td>
<td>241,800</td>
</tr>
<tr>
<td>Patterns and flasks</td>
<td>231,500</td>
<td>0.21</td>
<td>23.70</td>
<td>4,844</td>
<td>231,500</td>
<td>231,500</td>
</tr>
<tr>
<td>Weighing apparatus</td>
<td>265,000</td>
<td>0.24</td>
<td>30.00</td>
<td>6,660</td>
<td>265,000</td>
<td>265,000</td>
</tr>
<tr>
<td>Furniture</td>
<td>188,500</td>
<td>0.17</td>
<td>31.83</td>
<td>4,408</td>
<td>188,500</td>
<td>188,500</td>
</tr>
<tr>
<td>Ladders</td>
<td>59,000</td>
<td>0.05</td>
<td>25.00</td>
<td>1,480</td>
<td>59,000</td>
<td>59,000</td>
</tr>
<tr>
<td>Fixtures</td>
<td>39,500</td>
<td>0.04</td>
<td>32.41</td>
<td>1,200</td>
<td>39,500</td>
<td>39,500</td>
</tr>
<tr>
<td>Equipment, playground</td>
<td>7,000</td>
<td>0.02</td>
<td>52.00</td>
<td>364</td>
<td>7,000</td>
<td>7,000</td>
</tr>
<tr>
<td>Caskets and coffins</td>
<td>6,000</td>
<td>0.06</td>
<td>37.50</td>
<td>225</td>
<td>6,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Machinery and electrical apparatus</td>
<td>1,000</td>
<td>*</td>
<td>25.00</td>
<td>25</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>108,577,360</td>
<td>100.00</td>
<td>$31.74</td>
<td>$3,442,546</td>
<td>108,577,360</td>
<td>108,577,360</td>
</tr>
</tbody>
</table>

*Less than 1-100 of 1 per cent.

Loblolly Pine (Pinus taeda).

Loblolly pine does not grow in Pennsylvania though it has a wide range extending from southern Maryland through all the southern states and extends as far west as Texas. Most of that used in Pennsylvania was reported as coming from Virginia and North Carolina, in which states it constitutes the largest proportion of the lumber production. It is a soft, wide ringed, thick sapped, yellow pine. It has very coarse straight grain, is moderately hard, strong and durable, resinous, brittle, easy to season and work, and takes paint well. It closely resembles shortleaf pine and meets similar uses, so that no attempt is ever made to distinguish it commercially. Over 51,000,000 feet is demanded yearly by the Pennsylvania wood users for a great variety of purposes, but over nine-tenths is reported by the box makers and the manufacturers of sash, doors, blinds, and other planing mill products.
Table 6.—Consumption of Loblolly Pine, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Boxes and crates, packing</td>
<td>26,173,429</td>
<td>79.56</td>
<td>$623,463</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>7,297,090</td>
<td>20.44</td>
<td>201,076</td>
</tr>
<tr>
<td>Car construction</td>
<td>4,827,625</td>
<td>14.24</td>
<td>125,422</td>
</tr>
<tr>
<td>Boards, cloth, hosey, etc.</td>
<td>1,600,000</td>
<td>1.56</td>
<td>18,125</td>
</tr>
<tr>
<td>Patterns and flasks</td>
<td>579,000</td>
<td>1.78</td>
<td>11,785</td>
</tr>
<tr>
<td>Equipment, playground</td>
<td>400,000</td>
<td>.12</td>
<td>8,000</td>
</tr>
<tr>
<td>Ladders</td>
<td>400,000</td>
<td>.12</td>
<td>8,000</td>
</tr>
<tr>
<td>Trunks and valises</td>
<td>160,000</td>
<td>.05</td>
<td>3,685</td>
</tr>
<tr>
<td>Fixtures</td>
<td>153,000</td>
<td>.05</td>
<td>3,118</td>
</tr>
<tr>
<td>Elevators</td>
<td>96,500</td>
<td>.03</td>
<td>3,118</td>
</tr>
<tr>
<td>Furniture</td>
<td>55,000</td>
<td>.11</td>
<td>1,176</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>41,500</td>
<td>.08</td>
<td>1,176</td>
</tr>
<tr>
<td>Machine construction</td>
<td>25,000</td>
<td>.07</td>
<td>790</td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>2,000</td>
<td>.11</td>
<td>120</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>5,000</td>
<td>.01</td>
<td>510</td>
</tr>
<tr>
<td>Total</td>
<td>51,241,544</td>
<td>100.00</td>
<td>$1,030,167</td>
</tr>
</tbody>
</table>

Pitch Pine (Pinus rigida).

Pitch pine furnishes the largest amount of yellow pine lumber that is cut in Pennsylvania. The tree has a large proportion of sapwood and is decidedly resinous. It grows scatteringly throughout the State and is more extensively used than the total in Table 7 would indicate, owing to the fact that after it is cut into lumber it is difficult for the manufacturer to identify it. The wood is very brittle, of medium weight, hard, coarse grained, weak, stiff, durable, and does not hold paint. Its principal use in Pennsylvania for manufacturing is for boxes and crates, though it meets a wider demand for structural work and for other uses where rough timber is required without further manufacture.

Table 7.—Consumption of Pitch Pine, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Boxes and crates,</td>
<td>6,531,800</td>
<td>68.21</td>
<td>$112,519</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>3,926,060</td>
<td>26.58</td>
<td>65,268</td>
</tr>
<tr>
<td>Car construction</td>
<td>155,000</td>
<td>1.31</td>
<td>11,933</td>
</tr>
<tr>
<td>Mine equipment</td>
<td>246,000</td>
<td>2.23</td>
<td>5,675</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>36,260</td>
<td>.32</td>
<td>1,837</td>
</tr>
<tr>
<td>Machine construction</td>
<td>49,100</td>
<td>.46</td>
<td>16,444</td>
</tr>
<tr>
<td>Patterns and flasks</td>
<td>44,000</td>
<td>.41</td>
<td>8,017</td>
</tr>
<tr>
<td>Fixtures</td>
<td>26,000</td>
<td>.30</td>
<td>3,200</td>
</tr>
<tr>
<td>Total</td>
<td>10,630,790</td>
<td>100.00</td>
<td>$182,684</td>
</tr>
</tbody>
</table>

6,186,500
Western White Pine (Pinus monticola).

This is not the species which produces the white pine lumber of Pennsylvania and the Lake states, but in appearance the wood closely resembles eastern white pine and is suitable for most of the purposes for which the eastern wood is used. Idaho, western Montana, and Washington supplied the most of it used in Pennsylvania. The industries demanding it are the makers of planing mill products and the car builders.

Table 8.—Consumption of Western White Pine, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planing mill products,</td>
<td>2,914,500</td>
<td>94.92</td>
<td>$30.55</td>
<td>$115,281</td>
<td>2,914,500</td>
</tr>
<tr>
<td>Car construction,</td>
<td>87,500</td>
<td>2.81</td>
<td>54.99</td>
<td>4,112</td>
<td>87,500</td>
</tr>
<tr>
<td>Patterns and flasks,</td>
<td>29,000</td>
<td>.91</td>
<td>46.78</td>
<td>1,398</td>
<td>29,000</td>
</tr>
<tr>
<td>Fixtures,</td>
<td>20,500</td>
<td>.67</td>
<td>42.56</td>
<td>850</td>
<td>20,500</td>
</tr>
<tr>
<td>Caskets and coffins,</td>
<td>20,000</td>
<td>.65</td>
<td>42.56</td>
<td>850</td>
<td>20,000</td>
</tr>
<tr>
<td>Total</td>
<td>3,070,500</td>
<td>100.00</td>
<td>$40.22</td>
<td>$123,496</td>
<td>3,070,500</td>
</tr>
</tbody>
</table>

Scrub Pine (Pinus virginiana).

This tree occurs most frequently in the coastal plain region from New York to Virginia, and for that reason is found in New Jersey and Delaware more extensively than in Pennsylvania. Its range extends from the clay ridges in the southeastern part of the State westward and northward into the foothills and mountain regions, scattered among the hardwoods. The common names in different localities are: Jersey pine, nigger pine, and bastard pine. On cut over areas restocking is heavy and springs up rapidly but the reproduction is best on old fields where in some localities it forms thick stands. It grows more slowly than loblolly or shortleaf and only a comparatively small proportion of the trees reach a size large enough for lumber. It has coarse, straight grain, wide sapwood, and is very brittle, soft, moderately strong, stiff, splits rather easily, is fairly durable and resinous. It can be recognized readily by its short dark green needles, two in a sheath, and by the fact that cones generally remain on the trees several years after they have dropped their seed. In Virginia the box makers and excelsior manufacturers use large quantities of this wood, while in Maryland and Delaware, it is cut into railroad ties, converted into boxes and crates, and, to a limited extent, is used for building materials. In Pennsylvania a quantity equal to the entire cut of yellow pine went to the box makers.
Table 9.—Consumption of Scrub Pine, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Boxes and crates, packing.</td>
<td>2,353,400</td>
<td>34.26</td>
<td>18 92</td>
</tr>
<tr>
<td>Planing mill products,</td>
<td>70,000</td>
<td>2.59</td>
<td>20 50</td>
</tr>
<tr>
<td>Car construction,</td>
<td>64,655</td>
<td>2.71</td>
<td>23 33</td>
</tr>
<tr>
<td>Total</td>
<td>2,826,055</td>
<td>100.00</td>
<td>19 10</td>
</tr>
</tbody>
</table>

Norway Pine or Red Pine (Pinus resinosa).

Pennsylvania is the southern limit of the range of Norway or red pine. It occurs in the State infrequently on higher elevations, scattered with hard-woods. The reddish color of the bark is the easiest means of identification. It is most commonly cut into lumber in the New England states and in the Lake states near the Canadian border. All that has been said of white pine generally applies to Norway pine. The two trees grow mixed together and are marketed in most cases indiscriminately as white pine, the other constituting only a relatively small per cent. of the consignment. It differs from white pine in that it is slightly heavier, harder, and more resinous. Where color is a consideration, red pine is separately specified and this accounts for the distinction that the manufacturers make who reported it separately for this investigation. When sold alone as Norway pine it grades lower than white pine. None of that used in Pennsylvania was reported as growing within the State. It has fine, straight grain, medium sapwood, is moderately hard, fairly dense, of medium weight, moderately strong, stiff, non-elastic, fairly brittle, readily split and easily seasoned, easy to work and keeps its shape.

Table 10.—Consumption of Norway Pine, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Car construction,</td>
<td>1,518,300</td>
<td>63.24</td>
<td>28 97</td>
</tr>
<tr>
<td>Planing mill products,</td>
<td>526,000</td>
<td>25.58</td>
<td>20 20</td>
</tr>
<tr>
<td>Elevators,</td>
<td>196,000</td>
<td>4.22</td>
<td>20 00</td>
</tr>
<tr>
<td>Boxes and crates, packing.</td>
<td>89,000</td>
<td>3.87</td>
<td>20 00</td>
</tr>
<tr>
<td>Tanks and silos,</td>
<td>58,000</td>
<td>2.15</td>
<td>15 00</td>
</tr>
<tr>
<td>Patterns and flasks,</td>
<td>43,010</td>
<td>1.55</td>
<td>25 00</td>
</tr>
<tr>
<td>Total</td>
<td>2,237,346</td>
<td>100.00</td>
<td>28 74</td>
</tr>
</tbody>
</table>
Sugar Pine (*Pinus lambertiana*).

Sugar pine is the largest pine tree in the United States and is cut almost entirely in California. The name is due to a sugary substance which exudes from the tree when the wood is bruised. It is a true white pine and the wood, except for its being slightly more resinous, is quite similar in appearance to eastern white pine. The uses of the two pines are almost identical, and for a number of purposes the western wood is substituted for the eastern. Sugar pine has a fine straight grain, narrow sapwood, is soft, fairly dense, of very light weight, moderately strong, stiff, non-elastic, easily split and seasoned, and very easy to work. Over a million feet are annually demanded by the Pennsylvania manufacturers. The largest quantity goes to the producers of sash, doors, and blinds. It is also demanded in considerable quantities for foundry patterns and for special uses in store and office fixtures.

Table 11.—Consumption of Sugar Pine, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Planing mill products,</td>
<td>1,122,000</td>
<td>24.25</td>
<td>48.20</td>
</tr>
<tr>
<td>Patterns and blanks,</td>
<td>50,000</td>
<td>4.12</td>
<td>50.00</td>
</tr>
<tr>
<td>Fixtures,</td>
<td>25,000</td>
<td>2.96</td>
<td>57.50</td>
</tr>
<tr>
<td>Instruments, musical,</td>
<td>11,200</td>
<td>.32</td>
<td>57.50</td>
</tr>
<tr>
<td>Instruments, professional and scientific,</td>
<td>5,000</td>
<td>.11</td>
<td>50.00</td>
</tr>
<tr>
<td>Manual training practice (sloyd),</td>
<td>500</td>
<td>.04</td>
<td>50.00</td>
</tr>
<tr>
<td>Total</td>
<td>1,213,700</td>
<td>100.00</td>
<td>50.53</td>
</tr>
</tbody>
</table>

Western Yellow Pine (*Pinus ponderosa*).

This species next to Douglas fir is more extensively cut into lumber than any of the other western woods, and in the western and central states is used for every purpose for which wood can be employed. Its range includes nearly all of the Rocky Mountain and Pacific coast states. On the market it goes to a large extent as white pine. Sometimes it is called California white pine and in the eastern states dealers give it assumed names, as in Philadelphia it was found being sold as maraschino white pine. The wood in a large number of cases closely resembles white pine and by ocular examination it is difficult to distinguish. It is, however, a true yellow pine, fine grained, and although somewhat heavier and more resinous than white pine, meets a number of uses for which white pine has heretofore been used. It is a cheaper wood and for that reason is a valuable lumber tree and has great possibilities. Box makers and the planing mills are the industries using it most extensively in Pennsylvania.
Table 12.—Consumption of Western Yellow Pine, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Per cent</th>
<th>Average cost per 1,000 ft. at factory</th>
<th>Total cost f.o.b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boxes and crates, packing</td>
<td>500,000</td>
<td>50.21</td>
<td>$20.00</td>
<td>$10,000</td>
<td>500,000</td>
<td></td>
</tr>
<tr>
<td>Planing mill products</td>
<td>320,000</td>
<td>32.56</td>
<td>51.94</td>
<td>17,190</td>
<td>520,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Furniture</td>
<td>10,000</td>
<td>1.00</td>
<td>45.00</td>
<td>450</td>
<td>500,000</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>830,000</td>
<td>100.00</td>
<td>$21,636</td>
<td>$21,636</td>
<td>500,000</td>
<td>0</td>
</tr>
</tbody>
</table>

HEMLOCKS.

Hemlock (Tsuga canadensis).

Although the cut in Pennsylvania is over 150 times the amount the manufacturers use, it is interesting to note that twenty-seven per cent of the hemlock going into further manufacture came from other states. In 1912 Pennsylvania ranked third in the production of hemlock lumber, being surpassed by Michigan and Wisconsin. Of the imported wood, West Virginia and New York furnished the largest amount. This is the eastern species of the hemlock, that grows from Nova Scotia to Georgia and as far west as Minnesota. It is light, brittle, cross grained, and coarse. It is more difficult to work than the pines and has more of a tendency to warp and twist. It is, however, strong and stiff and non-resinous, holds nails well, and is fairly durable. It is cheaper than similar grades of the principal pines, and in the east central states it is more largely used than any other wood for framing, sheathing, and other uses of rough lumber in building construction. Among the factories of the State, the box industry and that of the planing mills use the largest amounts of this wood, but ten other industries demand small quantities for a variety of purposes.

Western Hemlock (Tsuga heterophylla).

Another species of hemlock was found being used in Pennsylvania, and it is interesting to note that it is the kind that grows only in the far western states commonly known as western hemlock to distinguish it from the eastern wood. This tree usually attains larger sizes than the eastern hemlock, but, like the latter, is found in association with other species and seldom in pure stands. It ranges from two to five feet in diameter and when cut into lumber, generally classes higher, showing less defects than its eastern relative. It is used by only one industry in Pennsylvania, the makers of tanks and silos.
### Table 13.—Consumption of Hemlock, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft. at factory.</td>
</tr>
<tr>
<td>Planing mill products,</td>
<td>22,077,000</td>
<td>52.62</td>
<td>$22.24</td>
</tr>
<tr>
<td>Boxes and crates, packing,</td>
<td>9,329,631</td>
<td>21.54</td>
<td>16.95</td>
</tr>
<tr>
<td>Ship and boat building,</td>
<td>4,925,000</td>
<td>10.89</td>
<td>25.92</td>
</tr>
<tr>
<td>Mine equipment,</td>
<td>2,200,750</td>
<td>5.20</td>
<td>20.82</td>
</tr>
<tr>
<td>Car construction,</td>
<td>2,066,975</td>
<td>4.66</td>
<td>15.58</td>
</tr>
<tr>
<td>Caskets and coffins,</td>
<td>1,009,090</td>
<td>2.32</td>
<td>28.00</td>
</tr>
<tr>
<td>Machine construction,</td>
<td>226,900</td>
<td>.50</td>
<td>15.49</td>
</tr>
<tr>
<td>Patterns and flasks,</td>
<td>291,500</td>
<td>.65</td>
<td>18.37</td>
</tr>
<tr>
<td>Dairymen's, poulterers' and apiarists' supplies,</td>
<td>215,900</td>
<td>.50</td>
<td>15.49</td>
</tr>
<tr>
<td>Machinery and apparatus, electric,</td>
<td>143,600</td>
<td>.32</td>
<td>26.85</td>
</tr>
<tr>
<td>Fixtures,</td>
<td>44,260</td>
<td>.90</td>
<td>28.64</td>
</tr>
<tr>
<td>Refrigerators and kitchen cabinets,</td>
<td>37,100</td>
<td>.09</td>
<td>22.13</td>
</tr>
<tr>
<td>Tanks and silos,</td>
<td>25,090</td>
<td>.06</td>
<td>18.69</td>
</tr>
<tr>
<td>Elevators,</td>
<td>3,906</td>
<td>.01</td>
<td>30.00</td>
</tr>
<tr>
<td>Instruments, musical,</td>
<td>2,600</td>
<td>.01</td>
<td>30.00</td>
</tr>
<tr>
<td>Manual training practice (sloyd),</td>
<td>262</td>
<td></td>
<td>34.35</td>
</tr>
<tr>
<td>Miscellaneous,</td>
<td>12,250</td>
<td>.03</td>
<td>28.16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>43,027,872</strong></td>
<td><strong>106.60</strong></td>
<td><strong>29.00</strong></td>
</tr>
</tbody>
</table>

**CYPRESS.**

*(Taxodium distichum)*

In Pennsylvania cypress next to yellow pine is the most widely used of any lumber coming from the southern states. It is typically a swamp tree of the southeastern coast and gulf region and up the Mississippi Basin as far as Missouri. The wood is light, soft, straight-grained, and of fine texture. Though more difficult than some woods to season properly, it holds its shape when thoroughly dried and is one of the most durable woods for which the manufacturers call. These qualities make it desirable for many purposes. The planing mills use the largest quantities, not only for porch, cornice, and other exterior work, but also for doors, sash, panels, moulding and other interior finish. The other seventeen industries in the State demanding this wood and the quantities used are listed in the following table:
Table 14.—Consumption of Cypress (Bald), year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft. at factory</th>
<th>Total cost f. o. b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planing mill products</td>
<td>13,790,290</td>
<td>81.01</td>
<td>$82.03</td>
<td>$745,613</td>
<td>13,790,290</td>
</tr>
<tr>
<td>Boxes and crates, packing</td>
<td>1,719,230</td>
<td>7.41</td>
<td>16.62</td>
<td>28,370</td>
<td>1,719,230</td>
</tr>
<tr>
<td>Tanks and silos</td>
<td>1,138,020</td>
<td>4.90</td>
<td>25.52</td>
<td>64,000</td>
<td>1,138,000</td>
</tr>
<tr>
<td>Dairymen's, poultryers', etc.</td>
<td>545,000</td>
<td>2.33</td>
<td>25.62</td>
<td>20,175</td>
<td>545,000</td>
</tr>
<tr>
<td>Car construction</td>
<td>532,000</td>
<td>1.52</td>
<td>35.00</td>
<td>18,800</td>
<td>532,000</td>
</tr>
<tr>
<td>Ship and boat building</td>
<td>287,000</td>
<td>1.24</td>
<td>55.64</td>
<td>15,970</td>
<td>287,000</td>
</tr>
<tr>
<td>Fixtures</td>
<td>111,400</td>
<td>.48</td>
<td>37.35</td>
<td>4,078</td>
<td>111,400</td>
</tr>
<tr>
<td>Furniture</td>
<td>90,000</td>
<td>.35</td>
<td>48.19</td>
<td>4,477</td>
<td>90,000</td>
</tr>
<tr>
<td>Ladders</td>
<td>62,500</td>
<td>.37</td>
<td>54.64</td>
<td>3,415</td>
<td>62,500</td>
</tr>
<tr>
<td>Laundry appliances</td>
<td>29,000</td>
<td>.27</td>
<td>39.10</td>
<td>1,325</td>
<td>29,000</td>
</tr>
<tr>
<td>Agricultural implements</td>
<td>30,000</td>
<td>.18</td>
<td>35.00</td>
<td>1,059</td>
<td>30,000</td>
</tr>
<tr>
<td>Caskets and coffins</td>
<td>20,000</td>
<td>.09</td>
<td>40.00</td>
<td>800</td>
<td>20,000</td>
</tr>
<tr>
<td>Elevators</td>
<td>10,000</td>
<td>.04</td>
<td>55.00</td>
<td>500</td>
<td>10,000</td>
</tr>
<tr>
<td>Gates and fencing</td>
<td>3,400</td>
<td>.02</td>
<td>55.00</td>
<td>211</td>
<td>3,400</td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>2,500</td>
<td>.01</td>
<td>43.00</td>
<td>109</td>
<td>2,500</td>
</tr>
<tr>
<td>Manual training practice (sloyd)</td>
<td>1,750</td>
<td>.01</td>
<td>63.53</td>
<td>111</td>
<td>1,750</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>1,060</td>
<td>.09</td>
<td>50.00</td>
<td>50</td>
<td>1,060</td>
</tr>
<tr>
<td>Machine construction</td>
<td>100</td>
<td>.05</td>
<td>75.00</td>
<td>11</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>23,195,200</td>
<td>100.00</td>
<td>$88.94</td>
<td>$900,265</td>
<td>22,195,200</td>
</tr>
</tbody>
</table>

SPRUCE.

Two species of eastern spruce, namely, red and white, and one northwestern species, Sitka spruce, are reported by the Pennsylvania manufacturers. It is impossible from the information obtained to present separate statistics for the eastern species. The red spruce, the species common in New York, Maine, and New Hampshire, is the tree appearing on the mountains in various parts of Pennsylvania. In 1912 spruce was reported cut by 129 sawmills of the State. The white spruce came into the State largely by water through the Great Lakes, from Wisconsin, Michigan, and Minnesota, where it is the common lumber tree. In appearance, qualities and sizes white spruce resembles red spruce. Spruce lumber irrespective of species is being substituted for white pine, especially in constructive work, box making, tanks and silo manufacture, and many other less important places where white pine was formerly used. Compared with it, however, spruce is weaker, less durable, more brittle, harder to work, whiter and of finer grain. It is non-resinous and therefore valuable for containers of foodstuffs. The western wood, Sitka spruce, comes from Washington and is used for a few special purposes. The planing mills reported its entire amount.
Table 15.—Consumption of Spruce, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>per cent.</td>
<td></td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Boxes and crates, packing,</td>
<td>14,648,870</td>
<td>71.32</td>
<td>$17.42</td>
<td>$253,211</td>
<td>975,250</td>
<td>13,673,590</td>
</tr>
<tr>
<td>Planing mill products,</td>
<td>1,929,731</td>
<td>9.74</td>
<td>26.96</td>
<td>55,504</td>
<td>118,040</td>
<td>1,823,284</td>
</tr>
<tr>
<td>Car construction,</td>
<td>1,366,836</td>
<td>6.66</td>
<td>36.85</td>
<td>30,032</td>
<td>102,700</td>
<td>1,177,596</td>
</tr>
<tr>
<td>Ship and boat building,</td>
<td>1,613,650</td>
<td>4.83</td>
<td>31.06</td>
<td>31,464</td>
<td>200,000</td>
<td>833,000</td>
</tr>
<tr>
<td>Refrigerators and kitchen cabinets,</td>
<td>413,900</td>
<td>2.01</td>
<td>37.39</td>
<td>15,474</td>
<td>150,000</td>
<td>223,500</td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>325,500</td>
<td>1.58</td>
<td>42.24</td>
<td>14,675</td>
<td>44,000</td>
<td>225,500</td>
</tr>
<tr>
<td>Patterns and laths,</td>
<td>325,900</td>
<td>1.59</td>
<td>32.33</td>
<td>7,523</td>
<td>44,000</td>
<td>179,988</td>
</tr>
<tr>
<td>Ladders</td>
<td>118,000</td>
<td>.98</td>
<td>43.40</td>
<td>3,250</td>
<td>150,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Frames and moulding, picture,</td>
<td>109,900</td>
<td>.49</td>
<td>30.03</td>
<td>3,000</td>
<td>100,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Tanks and silos,</td>
<td>109,600</td>
<td>.49</td>
<td>29.00</td>
<td>3,000</td>
<td>100,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Machinery and apparatus, electrical,</td>
<td>87,700</td>
<td>.43</td>
<td>26.00</td>
<td>2,200</td>
<td>87,700</td>
<td>87,700</td>
</tr>
<tr>
<td>Gates and fencing,</td>
<td>36,000</td>
<td>.17</td>
<td>25.00</td>
<td>900</td>
<td>36,000</td>
<td>36,000</td>
</tr>
<tr>
<td>Elevators</td>
<td>10,000</td>
<td>.05</td>
<td>30.00</td>
<td>300</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Vehicles and vehicle parts,</td>
<td>8,000</td>
<td>.04</td>
<td>48.88</td>
<td>391</td>
<td>1,000</td>
<td>7,900</td>
</tr>
<tr>
<td>Fixtures</td>
<td>1,500</td>
<td>.01</td>
<td>42.00</td>
<td>63</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Toys</td>
<td>1,000</td>
<td>.01</td>
<td>43.00</td>
<td>36</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Woodenware and novelties,</td>
<td>1,000</td>
<td>.01</td>
<td>43.00</td>
<td>36</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>10,000</td>
<td>.05</td>
<td>30.00</td>
<td>250</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Total</td>
<td>26,539,678</td>
<td>100</td>
<td>$31 34</td>
<td>$438,216</td>
<td>1,786,408</td>
<td>18,752,628</td>
</tr>
</tbody>
</table>

DOUGLAS FIR.  
(Pseudotsuga taxifolia).

Over three and a third million feet of Douglas fir, often called Oregon pine, is brought from the far western states to Pennsylvania to meet the demands of three industries: Ship building, planing mill products, and the manufacture of tanks and silos. It is primarily reported for structural work, because it possesses superior tensile strength, and, because it grows in large sizes and timbers of large dimensions are readily obtainable. In this latter respect it is the chief competitor of longleaf pine in the eastern and middle states. It is also valuable as a decorative wood, owing to its attractive grain and figure and the fact that it takes stain readily. This accounts for its rapid growth in popularity in recent years for doors, moulding, wainscoting, stairwork, and for other interior finish.
### Table 16.—Consumption of Douglas Fir, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f.o.b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
<td></td>
</tr>
<tr>
<td>Ship and boat building</td>
<td>2,521,000</td>
<td>74.34</td>
<td>$42.41</td>
<td>$106,826</td>
<td>2,521,000</td>
</tr>
<tr>
<td>Tanks and silos</td>
<td>450,000</td>
<td>12.57</td>
<td>43.32</td>
<td>18,500</td>
<td>450,000</td>
</tr>
<tr>
<td>Machine construction</td>
<td>396,000</td>
<td>5.84</td>
<td>51.25</td>
<td>19,500</td>
<td>396,000</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>108,500</td>
<td>3.23</td>
<td>42.33</td>
<td>4,701</td>
<td>396,000</td>
</tr>
<tr>
<td>Car construction</td>
<td>70,238</td>
<td>2.49</td>
<td>45.35</td>
<td>3,109</td>
<td>70,238</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>14,490</td>
<td>.43</td>
<td>50.60</td>
<td>720</td>
<td>14,490</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,364,128</strong></td>
<td><strong>100.00</strong></td>
<td><strong>$43.19</strong></td>
<td><strong>$145,386</strong></td>
<td><strong>3,364,128</strong></td>
</tr>
</tbody>
</table>

### Red Cedar (Juniperus virginiana).

The Pennsylvania wood users report the use of three woods known as cedars. Two of them grow in Pennsylvania and the other is a western wood. Red cedar, often called juniper, has a range covering all the states east and several west of the Mississippi River, but now commercially most abundant in Tennessee and southward. The Pennsylvania factories consume annually 861,000 feet of this and only about two per cent. was cut in the State. It was called for by nine industries, the most important of which were makers of professional instruments, including the lead pencil makers, planing mill products, furniture and caskets.

### Table 17.—Consumption of Red Cedar, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f.o.b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
<td></td>
</tr>
<tr>
<td>Instruments, professional and scientific</td>
<td>240,000</td>
<td>27.32</td>
<td>$52.00</td>
<td>$12,480</td>
<td>240,000</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>232,000</td>
<td>24.25</td>
<td>49.27</td>
<td>10,495</td>
<td>232,000</td>
</tr>
<tr>
<td>Furniture</td>
<td>178,100</td>
<td>26.27</td>
<td>69.51</td>
<td>10,920</td>
<td>178,100</td>
</tr>
<tr>
<td>Caskets and coffins</td>
<td>165,000</td>
<td>19.28</td>
<td>69.72</td>
<td>11,275</td>
<td>165,000</td>
</tr>
<tr>
<td>Dairymen's, poulterers' and apiarists' supplies</td>
<td>45,600</td>
<td>5.33</td>
<td>55.80</td>
<td>2,475</td>
<td>45,600</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>875,500</strong></td>
<td><strong>100.00</strong></td>
<td><strong>$49.454</strong></td>
<td><strong>$17,500</strong></td>
<td><strong>875,500</strong></td>
</tr>
</tbody>
</table>
Western Red Cedar (Thuja plicata).

The western red cedar is the largest cedar that grows and it is the foremost shingle wood of the country. It is commonly cut into wide boards and plank and is more abundant than eastern cedar, but the wood is lighter, weaker, softer, less durable, and more spongy in texture. The red cedars are so named on account of the color of the heartwood and the white cedar on account of its lack of color. The planing mills are the only class of factories bringing the western red cedar into Pennsylvania.

Southern White Cedar (Chamaecyparis thyoides).

Southern white cedar grows principally near the Atlantic Coast on lowlands and is best developed in states from New Jersey southward. The western limit of its range is in the extreme eastern portion of Pennsylvania, but none of the wood the manufacturers used was State-grown. The boat builders and the tank and silo makers accounted for ninety-seven per cent. of all the nearly four million feet used in the State. White cedar lumber is readily seasoned, easily worked, splits straight, and is regarded the most durable of any of the domestic woods. It possesses a remarkably straight, fine grain and a fine compact structure. It is probable that a small per cent. of this wood reported as white cedar may have been the northern white cedar often called arborvitae (Thuja occidentalis), but there was nothing in the information received to indicate it. Arborvitae is found on high elevations as far south as North Carolina but south of New York State rarely attains sufficient size to be of any commercial importance.

Table 18.—Consumption of Cedar, Southern White, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Average cost per 1,000 ft.</td>
<td>Total cost f. a. b. factory.</td>
</tr>
<tr>
<td>Tanks and sills,</td>
<td>2,554,000</td>
<td>$36.34</td>
<td>$88,740</td>
</tr>
<tr>
<td>Ship and boat building,</td>
<td>1,063,000</td>
<td>$40.90</td>
<td>41,670</td>
</tr>
<tr>
<td>Gates and fencing,</td>
<td>109,000</td>
<td>$30.00</td>
<td>3,270</td>
</tr>
<tr>
<td>Furniture,</td>
<td>1,300</td>
<td>$30.00</td>
<td>390</td>
</tr>
<tr>
<td>Planing mill products,</td>
<td>1,000</td>
<td>$30.00</td>
<td>300</td>
</tr>
<tr>
<td>Total</td>
<td>3,767,300</td>
<td>$41.74</td>
<td>$155,596</td>
</tr>
</tbody>
</table>

REDWOOD (Sequoia sempervirens).

This tree is closely related to the famous "Big Trees," which attain the largest size of any known tree. Practically all of the redwood lumber produced in this country comes from California. Redwood, and the sugar pine, the other California wood described above, are the highest priced softwoods that the Pennsylvania manufacturers report. Owing to its fine texture, great durability, stability in place, and excellent quality, redwood is more and more entering the eastern markets in spite of its cost. Its name is due to the red color of its wood, which fades when long exposed to the weather.
Table 19.—Consumption of Redwood, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
<td>Total cost f. o. b. factory</td>
</tr>
<tr>
<td>Planing mill products,</td>
<td>197,132</td>
<td>38.35</td>
<td>$19.19</td>
</tr>
<tr>
<td>Patterns and flasks,</td>
<td>136,000</td>
<td>26.88</td>
<td>9.74</td>
</tr>
<tr>
<td>Car construction,</td>
<td>100,000</td>
<td>19.77</td>
<td>5.65</td>
</tr>
<tr>
<td>Caskets and collars,</td>
<td>30,000</td>
<td>3.96</td>
<td>54.00</td>
</tr>
<tr>
<td>Printing material,</td>
<td>20,000</td>
<td>3.96</td>
<td>65.00</td>
</tr>
<tr>
<td>Ship and boat building,</td>
<td>36,000</td>
<td>3.96</td>
<td>52.30</td>
</tr>
<tr>
<td>Instruments, musical,</td>
<td>16,000</td>
<td>1.95</td>
<td>40.04</td>
</tr>
<tr>
<td>Rollers and poles,</td>
<td>2,000</td>
<td>.28</td>
<td>45.03</td>
</tr>
<tr>
<td>Fixtures,</td>
<td>500</td>
<td>.01</td>
<td>50.00</td>
</tr>
<tr>
<td>Manual training practice</td>
<td>50</td>
<td>.01</td>
<td>60.00</td>
</tr>
<tr>
<td>Total,</td>
<td>506,682</td>
<td>100.00</td>
<td>$56.36</td>
</tr>
</tbody>
</table>

TAMARACK.  
(Larix laricina).

Pennsylvania marks the southern limit of the eastern species of tamarack. Of the limited quantity of lumber used by the factories, a small per cent. was from timbers cut in the extreme northwestern part of the State. It is distinctly a swamp tree, but the wood in its physical properties is similar to southern pine, although it is claimed to be more durable. In quality it is hard, dense, moderately heavy, strong, very stiff, moderately tough, elastic, hard to split, difficult to work, non-resinous, and with an intermittent grain. Only two industries in Pennsylvania reported the use of tamarack. It went for parts in boat building and to the planing mills for finished material used in house construction.

BALSAM FIR.  
(Adies balsamea.)

Balsam fir is found growing in Pennsylvania, but being near the southern limit of its range the trees are of small size and of little commercial value. In the Lake states and in New England, as well as throughout the whole of Canada, this tree grows in swamps, usually associated with tamarack, black spruce, white cedar, etc. It appears also on the uplands, but it is much less common. The wood is soft, weak, and perishable, but has long, tough, colorless fibers, which make it valuable in paper manufacture. Like black spruce, its principal use is for pulp.

In Canada ninety-five per cent. of this wood is said to be cut for this purpose. The lumber serves many of the purposes for which spruce is demanded, but in Pennsylvania the planing mills were the only class of manufacturers reporting it.

THE HARDWOODS.

In the use of wood for making articles of final form a larger quantity of softwood is demanded than of hardwood; but the hardwoods meet a greater number of uses than softwoods and are more important as to distribution among the various industries. The hardwoods form about forty-five per
cent. of the total lumber cut in the State, and of the thirty-five kinds reported for manufacture, exclusive of the imported foreign woods, all but five were cut wholly or in part within the State, while of the twenty-three conifers or softwoods a portion of the supply of only thirteen were returned as State-grown.

OAKS.

The oaks are the leading hardwoods consumed by the Pennsylvania wood users. In trade the wood of the oaks is separated into two general classes, white oaks and red oaks, but the botanist's classification, which is based on difference in flower, fruit, and leaf, divides the oaks into more than fifty species. The manufacturer bases his distinction upon the qualities of the wood. The white oaks possess an even grain and fine texture, and are usually strong, hard, heavy, tough, dense, and durable but difficult to season; the red oaks are less strong and durable, and not so dense, but more easily worked because softer, more easily kiln-dried and, on account of being more porous they take stains and varnish more readily. Oak is brought into Pennsylvania in greater quantities than any other wood except shortleaf pine notwithstanding the fact that the cut of State-grown oak exceeds the quantity used by the manufacturers by over ninety million feet. There are many instances in which oak is demanded because it is the best suited and often the only practical material for the purpose. This accounts for the wood being first in importance for meeting a greater number of uses in Pennsylvania than any other American wood. Thirty-five industries demand some one or more of the white oak group and thirty-two industries one or more of the red oaks. The number of uses reported, as shown in the summary in the following pages, for the white oak is 738 and for the red oak 310. The car builders consume over one-half of the former and considerably more than one-third of all the latter that goes into further manufacture in the State. The furniture makers, including the chair industry, use over six and one-half million feet more red than white oak, but on the other hand, for vehicles, ship building, machine construction and agricultural implements white oak is largely preferred to red oak. For a comparison of the qualities of the two classes, the white oaks may be said generally to have intermediate straight grain, and are very hard, porous, very heavy, very strong, moderately stiff and elastic, and tough. They also split easily, are durable, rather difficult to season and to work. The red group generally are relatively coarse, straight grained, very hard, very porous, heavy, strong, stiff, non-elastic, and tough. This wood splits rather easily, is moderately durable, and rather difficult to season.

Table 20.—Consumption of Oak, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory.</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Car construction</td>
<td>81,368,363</td>
<td>44.72</td>
<td>$26.14</td>
<td>21,010,100</td>
<td>51,358,251</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>28,386,721</td>
<td>16.38</td>
<td>40.65</td>
<td>1,082,133</td>
<td>21,903,900</td>
</tr>
<tr>
<td>Furniture</td>
<td>26,724,730</td>
<td>14.41</td>
<td>42.29</td>
<td>1,034,288</td>
<td>25,114,582</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>7,873,897</td>
<td>4.23</td>
<td>35.48</td>
<td>726,572</td>
<td>5,186,627</td>
</tr>
<tr>
<td>Boxes and crates, packing</td>
<td>7,604,557</td>
<td>4.18</td>
<td>16.68</td>
<td>122,249</td>
<td>1,485,877</td>
</tr>
<tr>
<td>----------</td>
<td>------------</td>
<td>-----------</td>
<td>----------------------------</td>
<td>--------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Ship and boat building</td>
<td>6,305,400</td>
<td>3.46</td>
<td>31.92</td>
<td>229,206</td>
<td>3,140,900</td>
</tr>
<tr>
<td>Chairs and chair stock</td>
<td>5,228,600</td>
<td>2.87</td>
<td>37.43</td>
<td>183,822</td>
<td>1,345,200</td>
</tr>
<tr>
<td>Fixtures</td>
<td>1,229,660</td>
<td>2.32</td>
<td>50.63</td>
<td>214,806</td>
<td>812,100</td>
</tr>
<tr>
<td>Agricultural implements</td>
<td>3,265,500</td>
<td>1.81</td>
<td>34.12</td>
<td>115,448</td>
<td>1,184,100</td>
</tr>
<tr>
<td>Machine construction</td>
<td>2,923,500</td>
<td>1.61</td>
<td>30.56</td>
<td>77,749</td>
<td>2,256,500</td>
</tr>
<tr>
<td>Mine equipment</td>
<td>2,827,772</td>
<td>1.55</td>
<td>17.22</td>
<td>48,257</td>
<td>2,827,772</td>
</tr>
<tr>
<td>Caskets and coffins</td>
<td>1,135,560</td>
<td>0.65</td>
<td>50.02</td>
<td>59,462</td>
<td>132,000</td>
</tr>
<tr>
<td>Equipment, playground</td>
<td>607,300</td>
<td>0.33</td>
<td>33.65</td>
<td>20,427</td>
<td>344,400</td>
</tr>
<tr>
<td>Refrigerators and kitchen cabinets</td>
<td>565,300</td>
<td>0.31</td>
<td>32.82</td>
<td>18,571</td>
<td>250,000</td>
</tr>
<tr>
<td>Toys</td>
<td>277,300</td>
<td>0.15</td>
<td>25.32</td>
<td>7,872</td>
<td>262,000</td>
</tr>
<tr>
<td>Dairymen's, poulterers' and apri-</td>
<td>241,000</td>
<td>0.33</td>
<td>20.26</td>
<td>3,882</td>
<td>209,000</td>
</tr>
<tr>
<td>arists' supplies,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plumbers' work</td>
<td>219,500</td>
<td>0.12</td>
<td>41.90</td>
<td>9,197</td>
<td>70,000</td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>190,000</td>
<td>0.10</td>
<td>42.28</td>
<td>8,023</td>
<td>50,000</td>
</tr>
<tr>
<td>Baskets and veneer packages</td>
<td>125,000</td>
<td>0.07</td>
<td>32.06</td>
<td>2,875</td>
<td>125,000</td>
</tr>
<tr>
<td>for fruit and vegetables,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machinery and apparatus, electrical</td>
<td>123,500</td>
<td>0.07</td>
<td>33.98</td>
<td>4,685</td>
<td>10,000</td>
</tr>
<tr>
<td>Frames and moulding, picture</td>
<td>115,000</td>
<td>0.07</td>
<td>34.30</td>
<td>6,462</td>
<td>20,000</td>
</tr>
<tr>
<td>Insulator pins and brackets</td>
<td>115,000</td>
<td>0.06</td>
<td>12.61</td>
<td>1,439</td>
<td>115,000</td>
</tr>
<tr>
<td>Saddles and harness</td>
<td>75,000</td>
<td>0.04</td>
<td>65.21</td>
<td>5,326</td>
<td>60,000</td>
</tr>
<tr>
<td>Handles</td>
<td>70,900</td>
<td>0.04</td>
<td>25.42</td>
<td>1,881</td>
<td>70,900</td>
</tr>
<tr>
<td>Laundry appliances</td>
<td>60,000</td>
<td>0.03</td>
<td>22.50</td>
<td>1,410</td>
<td>20,000</td>
</tr>
<tr>
<td>Elevators</td>
<td>55,000</td>
<td>0.03</td>
<td>42.00</td>
<td>2,556</td>
<td>20,000</td>
</tr>
<tr>
<td>Tanks and silos</td>
<td>50,000</td>
<td>0.03</td>
<td>32.03</td>
<td>2,150</td>
<td>50,000</td>
</tr>
<tr>
<td>Sporting and athletic goods</td>
<td>42,000</td>
<td>0.02</td>
<td>38.21</td>
<td>1,695</td>
<td>31,500</td>
</tr>
<tr>
<td>Patterns and flasks</td>
<td>36,000</td>
<td>0.02</td>
<td>34.67</td>
<td>1,248</td>
<td>36,000</td>
</tr>
<tr>
<td>Shuttles, spools and bobbins</td>
<td>25,000</td>
<td>0.02</td>
<td>30.09</td>
<td>1,700</td>
<td>5,000</td>
</tr>
<tr>
<td>Woollenware and novelties</td>
<td>27,000</td>
<td>0.02</td>
<td>31.88</td>
<td>884</td>
<td>25,000</td>
</tr>
<tr>
<td>Manual training practice</td>
<td>23,500</td>
<td>0.01</td>
<td>77.24</td>
<td>1,820</td>
<td>13,000</td>
</tr>
<tr>
<td>(skyd)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulleys and conveyors</td>
<td>20,500</td>
<td>0.01</td>
<td>28.05</td>
<td>575</td>
<td>20,500</td>
</tr>
<tr>
<td>Trolleys and curtain poles,</td>
<td>19,000</td>
<td>0.01</td>
<td>17.25</td>
<td>210</td>
<td>19,000</td>
</tr>
<tr>
<td>Clocks</td>
<td>16,500</td>
<td>0.01</td>
<td>67.97</td>
<td>1,138</td>
<td>16,500</td>
</tr>
<tr>
<td>Instruments, professional and</td>
<td>10,000</td>
<td>0.01</td>
<td>55.00</td>
<td>500</td>
<td>10,000</td>
</tr>
<tr>
<td>scientific</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brushes</td>
<td>600</td>
<td>0.01</td>
<td>37.00</td>
<td>22</td>
<td>600</td>
</tr>
<tr>
<td>Total</td>
<td>182,927,830</td>
<td>100.00</td>
<td>$32,250</td>
<td>$5,681,841</td>
<td>67,217,711</td>
</tr>
</tbody>
</table>

*Less than 1-100 of one per cent.

The white and red oak groups have been combined in this table.

In Part II of the Report the information is given separately.

**YELLOW POPLAR.**

(Liriodendron tulipifera).

Forty-one classes of factories demand yellow poplar, which next to sugar maple, shows the widest distribution among industries of any wood that Pennsylvania factories demand. In this particular it excels white oak. The number of particular uses (see table of uses) reported for yellow poplar, however, is nearly 50 per cent. less than for white oak, while the total poplar used in the State was less by forty million feet. Yellow poplar is of fine texture, more easily worked, takes paint readily, and holds its shape after drying better than any other domestic wood. In texture it is similar to basswood. Because it is frequently called whitewood it is often confused with basswood, but is softer. There is a great difference between the heartwood and the sapwood of yellow poplar; the former in a number of in-
stanes being sold on the market as yellow poplar because of its yellow color, and the latter as white poplar or whitewood, and therefore number of instances being sold on the market as yellow poplar because of its yellow color, and the latter as white poplar or whitewood, and therefore often regarded by users as separate species. The tree is frequently called tulip tree and the wood tulip poplar. There is but one species of this genus in this country. It is interesting to note that of the total amount of yellow poplar going into manufacture, over thirteen million feet were cut from State-grown timber. This amount was about two million feet less than the reported cut of this species in the State.

Table 21.—Consumption of Yellow Poplar, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boxes and crates, packing</td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>$</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>18,278,232</td>
<td>32.75</td>
<td>17.44</td>
<td>323,571</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>3,761,293</td>
<td>6.64</td>
<td>37.20</td>
<td>1,045,665</td>
</tr>
<tr>
<td>Car construction</td>
<td>2,127,113</td>
<td>3.82</td>
<td>37.42</td>
<td>385,156</td>
</tr>
<tr>
<td>Furniture</td>
<td>2,392,900</td>
<td>2.10</td>
<td>36.62</td>
<td>166,527</td>
</tr>
<tr>
<td>Fixtures</td>
<td>2,387,600</td>
<td>2.14</td>
<td>37.31</td>
<td>32,929</td>
</tr>
<tr>
<td>Boats,</td>
<td>1,060,000</td>
<td>1.80</td>
<td>39.38</td>
<td>31,440</td>
</tr>
<tr>
<td>Boxes, cigar</td>
<td>1,460,928</td>
<td>1.84</td>
<td>75.31</td>
<td>78,463</td>
</tr>
<tr>
<td>Agricultural implements</td>
<td>73,500</td>
<td>1.23</td>
<td>34.59</td>
<td>26,305</td>
</tr>
<tr>
<td>Caskets and coffins</td>
<td>745,000</td>
<td>1.32</td>
<td>32.10</td>
<td>24,065</td>
</tr>
<tr>
<td>Toys</td>
<td>702,000</td>
<td>1.24</td>
<td>25.48</td>
<td>17,888</td>
</tr>
<tr>
<td>Excelsior</td>
<td>688,000</td>
<td>1.21</td>
<td>15.06</td>
<td>10,020</td>
</tr>
<tr>
<td>Machine construction</td>
<td>690,000</td>
<td>1.07</td>
<td>16.44</td>
<td>10,630</td>
</tr>
<tr>
<td>Laundry appliances</td>
<td>506,000</td>
<td>1.06</td>
<td>28.27</td>
<td>16,000</td>
</tr>
<tr>
<td>Refrigerators and kitchen cabinets</td>
<td>432,500</td>
<td>0.42</td>
<td>30.11</td>
<td>15,045</td>
</tr>
<tr>
<td>Woodenware and novelties</td>
<td>431,000</td>
<td>0.51</td>
<td>35.50</td>
<td>11,715</td>
</tr>
<tr>
<td>Shuttles, spools, and bobbins</td>
<td>390,000</td>
<td>0.34</td>
<td>36.89</td>
<td>6,500</td>
</tr>
<tr>
<td>Dairymen’s, confectioners’ and api-</td>
<td>320,000</td>
<td>0.30</td>
<td>40.08</td>
<td>6,400</td>
</tr>
<tr>
<td>arists’ supplies</td>
<td>225,000</td>
<td>0.29</td>
<td>36.73</td>
<td>6,800</td>
</tr>
<tr>
<td>Brushes</td>
<td>235,000</td>
<td>0.24</td>
<td>70.54</td>
<td>6,387</td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>214,000</td>
<td>0.21</td>
<td>40.09</td>
<td>5,200</td>
</tr>
<tr>
<td>Plumbers’ woodwork</td>
<td>148,000</td>
<td>0.18</td>
<td>45.00</td>
<td>4,500</td>
</tr>
<tr>
<td>Pumps</td>
<td>144,000</td>
<td>0.17</td>
<td>40.00</td>
<td>4,700</td>
</tr>
<tr>
<td>Frames and moulding, pictures, ship and boat building</td>
<td>87,000</td>
<td>0.13</td>
<td>35.51</td>
<td>3,500</td>
</tr>
<tr>
<td>84,000</td>
<td>0.12</td>
<td>36.07</td>
<td>4,875</td>
<td>2,500</td>
</tr>
<tr>
<td>Elevators</td>
<td>82,000</td>
<td>0.14</td>
<td>41.88</td>
<td>3,415</td>
</tr>
<tr>
<td>Pulleys and conveyors</td>
<td>80,000</td>
<td>0.14</td>
<td>28.25</td>
<td>2,500</td>
</tr>
<tr>
<td>Patterns and blanks</td>
<td>38,000</td>
<td>0.09</td>
<td>36.82</td>
<td>1,805</td>
</tr>
<tr>
<td>Clocks</td>
<td>35,000</td>
<td>0.09</td>
<td>35.57</td>
<td>1,175</td>
</tr>
<tr>
<td>Boot and shoe findings</td>
<td>36,000</td>
<td>0.08</td>
<td>35.67</td>
<td>1,700</td>
</tr>
<tr>
<td>Equipment, playground</td>
<td>35,000</td>
<td>0.04</td>
<td>36.00</td>
<td>900</td>
</tr>
<tr>
<td>Chairs and chair stocks</td>
<td>24,000</td>
<td>0.04</td>
<td>35.05</td>
<td>900</td>
</tr>
<tr>
<td>Instruments, professional and scientific</td>
<td>16,800</td>
<td>0.05</td>
<td>73.73</td>
<td>1,210</td>
</tr>
<tr>
<td>Manual training (sloyd)</td>
<td>16,250</td>
<td>0.02</td>
<td>66.66</td>
<td>1,088</td>
</tr>
<tr>
<td>Mine equipment</td>
<td>14,000</td>
<td>0.02</td>
<td>22.50</td>
<td>315</td>
</tr>
<tr>
<td>Machinery and apparatus, electric</td>
<td>10,000</td>
<td>0.02</td>
<td>55.00</td>
<td>566</td>
</tr>
<tr>
<td>Weighing apparatus</td>
<td>10,000</td>
<td>0.05</td>
<td>25.00</td>
<td>250</td>
</tr>
<tr>
<td>Gates and fencing</td>
<td>5,000</td>
<td>0.01</td>
<td>50.00</td>
<td>120</td>
</tr>
<tr>
<td>Printing material</td>
<td>5,000</td>
<td>0.01</td>
<td>10.00</td>
<td>100</td>
</tr>
<tr>
<td>Sporting and athletic goods, etc</td>
<td>5,000</td>
<td>0.01</td>
<td>20.00</td>
<td>140</td>
</tr>
<tr>
<td>Ladders</td>
<td>4,000</td>
<td>0.01</td>
<td>50.00</td>
<td>40</td>
</tr>
<tr>
<td>Rollers and poles</td>
<td>1,000</td>
<td>0.01</td>
<td>65.00</td>
<td>20</td>
</tr>
</tbody>
</table>

Total | 56,729,992 | 100.00 | $32.62 | $1,800,151 | 13,623,992 | 43,797,385 |

*Less than 1/100 of 1 per cent.
MAPLES.

Three maples are cut for lumber in Pennsylvania, sugar maple, sometimes called hard maple (Acer saccharum), the red or soft maple (Acer rubrum), and the white or silvery maple (Acer saccharinum). Of these the sugar maple is commercially the most important and it is probably the most valuable wood produced in Pennsylvania. This is because of the abundance of maple sugar it produces, the choice figured woods known as bird's eye and curly maple, etc., and the many uses for which this wood alone is the most adaptable, owing to its combined qualities of strength, hardness, stiffness, and its ability to hold its shape after being properly seasoned. Forty-two industries report its use, which is a greater number than for any other wood named in this report. It is abundant on well-drained land, particularly in the northern, western, and middle portions of the State. Next to white oak, sugar maple was reported as meeting the greatest number of uses, and was the fourth important hardwood in the total quantity used. It also bears the distinction, among the woods that are used in quantities exceeding 5,000,000 feet, of furnishing the largest proportion of State-grown wood.

Table 22.—Consumption of Sugar Maple, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Per cent.</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost for factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boxes and crates, packing,</td>
<td>11,647,000</td>
<td>21.19</td>
<td>$16.42</td>
<td>$191,340</td>
<td>3,282,500</td>
<td>8,364,500</td>
</tr>
<tr>
<td>Planing mill products,</td>
<td>3,921,500</td>
<td>7.62</td>
<td>28.76</td>
<td>233,968</td>
<td>5,676,000</td>
<td>10,608,000</td>
</tr>
<tr>
<td>Laundry appliances,</td>
<td>5,340,500</td>
<td>11.54</td>
<td>33.75</td>
<td>106,613</td>
<td>2,385,500</td>
<td>2,965,000</td>
</tr>
<tr>
<td>Chairs and chair stock,</td>
<td>5,340,100</td>
<td>9.77</td>
<td>18.54</td>
<td>98,100</td>
<td>4,746,500</td>
<td>601,000</td>
</tr>
<tr>
<td>Furniture,</td>
<td>4,743,900</td>
<td>9.03</td>
<td>26.72</td>
<td>150,522</td>
<td>3,046,100</td>
<td>1,165,500</td>
</tr>
<tr>
<td>Shutters, spoons, and bobbin,</td>
<td>5,328,000</td>
<td>9.99</td>
<td>24.65</td>
<td>62,316</td>
<td>1,239,000</td>
<td>656,000</td>
</tr>
<tr>
<td>Handles,</td>
<td>3,367,500</td>
<td>6.55</td>
<td>19.62</td>
<td>63,507</td>
<td>1,272,700</td>
<td>550,150</td>
</tr>
<tr>
<td>Car construction,</td>
<td>1,076,100</td>
<td>2.02</td>
<td>18.14</td>
<td>35,556</td>
<td>1,344,000</td>
<td>631,450</td>
</tr>
<tr>
<td>Brushes,</td>
<td>1,050,500</td>
<td>2.00</td>
<td>20.04</td>
<td>54,772</td>
<td>1,088,500</td>
<td>............</td>
</tr>
<tr>
<td>Woodenware and novelties,</td>
<td>1,049,500</td>
<td>2.01</td>
<td>20.34</td>
<td>54,780</td>
<td>277,500</td>
<td>560,500</td>
</tr>
<tr>
<td>Agricultural implements,</td>
<td>1,082,000</td>
<td>2.03</td>
<td>26.64</td>
<td>26,582</td>
<td>265,500</td>
<td>667,500</td>
</tr>
<tr>
<td>Mine equipment,</td>
<td>790,200</td>
<td>1.41</td>
<td>18.87</td>
<td>11,763</td>
<td>780,300</td>
<td>............</td>
</tr>
<tr>
<td>Toys,</td>
<td>782,500</td>
<td>1.49</td>
<td>25.51</td>
<td>19,590</td>
<td>712,500</td>
<td>50,000</td>
</tr>
<tr>
<td>Boards,</td>
<td>765,000</td>
<td>1.48</td>
<td>46.46</td>
<td>32,750</td>
<td>69,000</td>
<td>656,000</td>
</tr>
<tr>
<td>Instruments, musical,</td>
<td>647,000</td>
<td>1.21</td>
<td>22.20</td>
<td>20,977</td>
<td>225,300</td>
<td>426,800</td>
</tr>
<tr>
<td>Vehicles and vehicle parts,</td>
<td>625,000</td>
<td>1.19</td>
<td>20.61</td>
<td>12,879</td>
<td>214,000</td>
<td>311,000</td>
</tr>
<tr>
<td>Machinery and apparatus, electrical,</td>
<td>568,500</td>
<td>1.09</td>
<td>34.85</td>
<td>19,465</td>
<td>159,000</td>
<td>408,500</td>
</tr>
<tr>
<td>Paddles, fruit and vegetable,</td>
<td>549,000</td>
<td>1.07</td>
<td>18.15</td>
<td>8,863</td>
<td>548,000</td>
<td>108,000</td>
</tr>
<tr>
<td>Pumps,</td>
<td>479,000</td>
<td>0.91</td>
<td>17.60</td>
<td>5,300</td>
<td>400,000</td>
<td>316,000</td>
</tr>
<tr>
<td>Fixtures,</td>
<td>396,000</td>
<td>0.76</td>
<td>23.14</td>
<td>8,482</td>
<td>317,500</td>
<td>48,500</td>
</tr>
<tr>
<td>Machine construction,</td>
<td>288,700</td>
<td>0.56</td>
<td>29.69</td>
<td>8,572</td>
<td>145,700</td>
<td>143,000</td>
</tr>
<tr>
<td>Butcher's blocks and skippers,</td>
<td>270,000</td>
<td>0.51</td>
<td>26.37</td>
<td>5,500</td>
<td>270,000</td>
<td>............</td>
</tr>
<tr>
<td>Whips, canes, and umbrella sticks,</td>
<td>241,100</td>
<td>0.46</td>
<td>17.97</td>
<td>4,287</td>
<td>341,100</td>
<td>1,165,500</td>
</tr>
<tr>
<td>Weighing apparatus,</td>
<td>171,900</td>
<td>0.33</td>
<td>33.33</td>
<td>5,665</td>
<td>21,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Dairymen's, poultrymen's and apiarists' supplies,</td>
<td>132,050</td>
<td>0.25</td>
<td>27.96</td>
<td>4,276</td>
<td>28,500</td>
<td>129,450</td>
</tr>
<tr>
<td>Elevators,</td>
<td>141,200</td>
<td>0.26</td>
<td>49.74</td>
<td>7,362</td>
<td>81,500</td>
<td>69,000</td>
</tr>
<tr>
<td>Boot and shoe findings,</td>
<td>100,500</td>
<td>0.19</td>
<td>56.56</td>
<td>5,914</td>
<td>100,500</td>
<td>100,500</td>
</tr>
<tr>
<td>Sporting and athletic goods,</td>
<td>77,500</td>
<td>0.15</td>
<td>26.56</td>
<td>3,285</td>
<td>47,500</td>
<td>59,000</td>
</tr>
<tr>
<td>Refrigerators and kitchen cabinets,</td>
<td>9,750</td>
<td>0.19</td>
<td>28.71</td>
<td>2,318</td>
<td>8,750</td>
<td>59,000</td>
</tr>
<tr>
<td>Pulleys and conveyors,</td>
<td>8,500</td>
<td>0.16</td>
<td>43.68</td>
<td>2,970</td>
<td>68,000</td>
<td>2,000</td>
</tr>
</tbody>
</table>
### Table 22—Concluded.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Patterns and flasks,</td>
<td>58,550</td>
<td>.69</td>
<td>47.46</td>
<td>2,399</td>
<td>28,850</td>
<td>11,710</td>
</tr>
<tr>
<td>Ladders,</td>
<td>50,000</td>
<td>.69</td>
<td>25.00</td>
<td>1,539</td>
<td>50,000</td>
<td>35,060</td>
</tr>
<tr>
<td>Caskets and coffins,</td>
<td>35,450</td>
<td>.69</td>
<td>16.66</td>
<td>575</td>
<td>27,000</td>
<td>425</td>
</tr>
<tr>
<td>Rollers and poles,</td>
<td>25,000</td>
<td>.69</td>
<td>36.94</td>
<td>630</td>
<td>3,000</td>
<td>29,020</td>
</tr>
<tr>
<td>Equipment, playground,</td>
<td>31,500</td>
<td>.69</td>
<td>22.45</td>
<td>109</td>
<td>2,050</td>
<td>1,000</td>
</tr>
<tr>
<td>Frames and moulding, picture, Ship and boat building,</td>
<td>3,560</td>
<td>.61</td>
<td>24.50</td>
<td>450</td>
<td>20,460</td>
<td>300</td>
</tr>
<tr>
<td>Manual training practice (Sloyd),</td>
<td>3,350</td>
<td>.61</td>
<td>24.50</td>
<td>450</td>
<td>3,050</td>
<td>300</td>
</tr>
<tr>
<td>Instruments, professional and scientific,</td>
<td>900</td>
<td>.61</td>
<td>40.00</td>
<td>37</td>
<td>900</td>
<td>420</td>
</tr>
<tr>
<td>Printing material,</td>
<td>500</td>
<td>.61</td>
<td>30.00</td>
<td>10</td>
<td>500</td>
<td>420</td>
</tr>
<tr>
<td>Plumbers’ woodworking,</td>
<td>300</td>
<td>.61</td>
<td>30.00</td>
<td>9</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Miscellaneous,</td>
<td>11,550</td>
<td>.61</td>
<td>30.00</td>
<td>235</td>
<td>11,500</td>
<td>300</td>
</tr>
<tr>
<td><strong>Total</strong>,</td>
<td><strong>54,955,985</strong></td>
<td><strong>100.00</strong></td>
<td><strong>232.29</strong></td>
<td><strong>$1,226,019</strong></td>
<td><strong>35,482,200</strong></td>
<td><strong>19,473,685</strong></td>
</tr>
</tbody>
</table>

**Red and Silver Maple.**

Red and silver maple both go in commerce under the name of soft maple. The former is cut from the hills and mountains of the State, where it grows abundantly and is associated with beech, birch, and hemlock, while the latter thrives best in bottomlands and along streams, in company with the willows; black ash, and river birch. The wood of these soft maples is similar to that of sugar maple except that it is lighter, softer, and slightly tougher. Relatively, they meet only a few uses and are distributed among only nineteen industries. Maple lumber, including all species, ranks next to oak in the hardwood cut of Pennsylvania.

### Table 23.—Consumption of Red and Silver Maple, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Furniture,</td>
<td>1,478,569</td>
<td>25.80</td>
<td>335.49</td>
<td>337,883</td>
<td>730,500</td>
<td>246,000</td>
</tr>
<tr>
<td>Boxes and crates, packing,</td>
<td>1,207,000</td>
<td>22.36</td>
<td>12.50</td>
<td>15,855</td>
<td>872,000</td>
<td>355,000</td>
</tr>
<tr>
<td>Chairs and chair stock,</td>
<td>918,500</td>
<td>16.09</td>
<td>23.37</td>
<td>25,876</td>
<td>155,000</td>
<td>78,000</td>
</tr>
<tr>
<td>Toys,</td>
<td>459,000</td>
<td>7.88</td>
<td>24.00</td>
<td>10,800</td>
<td>450,000</td>
<td>350,000</td>
</tr>
<tr>
<td>Shuttles, spools, and bobbins,</td>
<td>725,000</td>
<td>6.57</td>
<td>29.43</td>
<td>24,900</td>
<td>40,000</td>
<td>225,000</td>
</tr>
<tr>
<td>Fixtures,</td>
<td>250,000</td>
<td>4.50</td>
<td>15.00</td>
<td>3,900</td>
<td>200,000</td>
<td>250,000</td>
</tr>
<tr>
<td>Woodenware and novelties,</td>
<td>216,250</td>
<td>3.68</td>
<td>14.43</td>
<td>3,035</td>
<td>240,000</td>
<td>250,000</td>
</tr>
<tr>
<td>Brushes,</td>
<td>156,000</td>
<td>2.73</td>
<td>18.96</td>
<td>2,937</td>
<td>156,000</td>
<td>250,000</td>
</tr>
<tr>
<td>Baskets, fruit and vegetable,</td>
<td>154,000</td>
<td>2.54</td>
<td>26.86</td>
<td>2,500</td>
<td>145,000</td>
<td>250,000</td>
</tr>
<tr>
<td>Whips, cane, and umbrella sticks,</td>
<td>107,000</td>
<td>1.87</td>
<td>26.45</td>
<td>2,820</td>
<td>2,000</td>
<td>105,000</td>
</tr>
</tbody>
</table>

Red and Silver Maple. The former is cut from the hills and mountains of the State, where it grows abundantly and is associated with beech, birch, and hemlock, while the latter thrives best in bottomlands and along streams, in company with the willows; black ash, and river birch. The wood of these soft maples is similar to that of sugar maple except that it is lighter, softer, and slightly tougher. Relatively, they meet only a few uses and are distributed among only nineteen industries. Maple lumber, including all species, ranks next to oak in the hardwood cut of Pennsylvania.
Table 23—Concluded.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost</th>
<th>Total cost</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet h. m.</td>
<td>per cent.</td>
<td>per 1,000 ft.</td>
<td>Feet h. m.</td>
<td>Feet h. m.</td>
</tr>
<tr>
<td>Laundry appliances</td>
<td>80,000</td>
<td>1.40</td>
<td>25 00</td>
<td>1,900</td>
<td>47,500</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>71,750</td>
<td>1.26</td>
<td>26 19</td>
<td>1,570</td>
<td>31,250</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>47,000</td>
<td>.82</td>
<td>26 15</td>
<td>1,228</td>
<td>47,000</td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>44,000</td>
<td>.77</td>
<td>26 82</td>
<td>1,189</td>
<td>41,000</td>
</tr>
<tr>
<td>Printing material</td>
<td>24,000</td>
<td>.44</td>
<td>31 66</td>
<td>760</td>
<td>20,000</td>
</tr>
<tr>
<td>Dairymen's, poulterers' and apiarists' supplies</td>
<td>15,000</td>
<td>.26</td>
<td>10 00</td>
<td>140</td>
<td>15,000</td>
</tr>
<tr>
<td>Pulleyrs and conveyors</td>
<td>15,000</td>
<td>.18</td>
<td>14 00</td>
<td>140</td>
<td>16,000</td>
</tr>
<tr>
<td>Patterns and flasks</td>
<td>1,000</td>
<td>.02</td>
<td>55 00</td>
<td>55</td>
<td>1,000</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>50,000</td>
<td>.88</td>
<td>31 66</td>
<td>760</td>
<td>50,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>57,112,275</td>
<td>100 00</td>
<td>821 66</td>
<td><strong>$129,000</strong></td>
<td><strong>$2,073,275</strong></td>
</tr>
</tbody>
</table>

CHESTNUT.

*Castanea dentata*.

Over 1,000 sawmills in Pennsylvania report the cut of chestnut, and the production of this lumber exceeds that of any other hardwood cut in the State. Manufacturers, classified among twenty-seven industries, report chestnut for nearly 200 separate and distinct uses. Though Pennsylvania is second in importance in the production of chestnut lumber and annually cuts nearly twice as much as the manufacturers consume, only forty per cent. of the total quantity purchased was grown in the State. The wood is coarse straight grained, light weight, moderately strong and hard, very stiff and brittle, durable when exposed, easily seasoned, and holds nails well. The wood is also rich in tannin and is therefore largely used in making tannin extracts. Its other valuable qualities are ease in working, great porosity, stiffness, non-elasticity, light weight, and brittleness. It has an attractive grain and a beautiful figure, and therefore has lately grown in popularity for inside finish of houses and buildings. Nearly two-thirds of the reported usage by manufacturers in Pennsylvania is for these and other planing mill products. The largest demand for chestnut is for rough forest products, as posts, telegraph poles, cross ties, mine props and tanning extract. The growing tree is subject to attacks by boring insects, which make the wood usually defective. Large quantities of the chestnut lumber used in Pennsylvania, therefore, are of the low grade known as "sound wormy" which shows the galleries of insect larvae, but is otherwise sound. It is this grade which the box makers use in amounts equal to more than twenty-three per cent. of the total, and it is this grade that the furniture manufacturers and piano builders demand for veneer backing, being light, holding its shape well, and with a special affinity for glue, and is especially adapted for this purpose. The casket makers use chestnut ahead of any other wood as experience has proved that this wood is one of the most durable underground. The sound wormy grade is most frequently employed as the injury by the borers does not seem to affect particularly its lasting qualities.

In recent years, the chestnut bark disease that has killed chestnut trees in New York and southern New England has made great inroads on the stand
in Pennsylvania. The rapid spread of the infection and its devastation in the infected areas of the State has produced such an alarming situation that the Commonwealth of Pennsylvania adopted measures looking to the possible control of the disease. A chestnut tree killed by the blight is killed by the girdling of the trunk. The disease does not injure the wood although it penetrates a few annual rings. The problem of utilizing the blight killed wood, the Federal Government has ascertained, is merely a question of using dead timber. The wood generally answers for all purposes for which healthy chestnut is demanded, and recent official strength tests have proved that sound killed chestnut is fully as strong as live healthy wood. To owners of blight killed timber, the Forest Service has pointed out the necessity of its use within two years after death as subsequent to that period, deterioration, due to checking, insect injury and decay, is quite rapid.

Table 24.—Consumption of Chestnut, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity.</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory.</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>per cent.</td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Planning mill products,</td>
<td>17,400,350</td>
<td>33.92</td>
<td>$37.65</td>
<td>$575,450</td>
<td>5,815,700</td>
</tr>
<tr>
<td>Boxes and crates,</td>
<td>11,556,560</td>
<td>22.52</td>
<td>$16.04</td>
<td>192,166</td>
<td>6,275,323</td>
</tr>
<tr>
<td>Furniture,</td>
<td>5,876,000</td>
<td>10.50</td>
<td>20.57</td>
<td>116,387</td>
<td>1,573,200</td>
</tr>
<tr>
<td>Fixtures,</td>
<td>1,856,550</td>
<td>5.387</td>
<td>25.16</td>
<td>183,564</td>
<td>1,114,250</td>
</tr>
<tr>
<td>Wine equipment,</td>
<td>778,400</td>
<td>14.6</td>
<td>15.42</td>
<td>11,557</td>
<td>749,400</td>
</tr>
<tr>
<td>Instruments, musical,</td>
<td>674,400</td>
<td>12.51</td>
<td>24.81</td>
<td>16,659</td>
<td>227,000</td>
</tr>
<tr>
<td>Toys,</td>
<td>560,000</td>
<td>7.5</td>
<td>31.00</td>
<td>10,500</td>
<td>500,000</td>
</tr>
<tr>
<td>Chairs and chair stock,</td>
<td>480,400</td>
<td>8.29</td>
<td>7.21</td>
<td>8,429</td>
<td>25,000</td>
</tr>
<tr>
<td>Agricultural implements,</td>
<td>146,000</td>
<td>7.29</td>
<td>19.61</td>
<td>2,670</td>
<td>49,500</td>
</tr>
<tr>
<td>Patterns, and flasks,</td>
<td>127,350</td>
<td>8.29</td>
<td>19.61</td>
<td>2,670</td>
<td>49,500</td>
</tr>
<tr>
<td>Car construction,</td>
<td>115,250</td>
<td>7.29</td>
<td>19.61</td>
<td>2,670</td>
<td>49,500</td>
</tr>
<tr>
<td>Baskets, fruit and vegetable,</td>
<td>166,000</td>
<td>5.15</td>
<td>19.61</td>
<td>2,670</td>
<td>49,500</td>
</tr>
<tr>
<td>Frames and moulding, picture,</td>
<td>53,350</td>
<td>8.29</td>
<td>7.21</td>
<td>8,429</td>
<td>25,000</td>
</tr>
<tr>
<td>Machine construction,</td>
<td>72,000</td>
<td>8.29</td>
<td>7.21</td>
<td>8,429</td>
<td>25,000</td>
</tr>
<tr>
<td>Trunks and values,</td>
<td>37,250</td>
<td>1.36</td>
<td>19.21</td>
<td>2,213</td>
<td>17,000</td>
</tr>
<tr>
<td>Vehicles and vehicle parts,</td>
<td>20,200</td>
<td>0.15</td>
<td>19.21</td>
<td>2,213</td>
<td>17,000</td>
</tr>
<tr>
<td>Tanks and sibes,</td>
<td>15,000</td>
<td>0.5</td>
<td>19.21</td>
<td>2,213</td>
<td>17,000</td>
</tr>
<tr>
<td>Refrigerators and kitchen cabinets,</td>
<td>11,500</td>
<td>0.2</td>
<td>19.21</td>
<td>2,213</td>
<td>17,000</td>
</tr>
<tr>
<td>Gates and fencing,</td>
<td>11,500</td>
<td>0.2</td>
<td>19.21</td>
<td>2,213</td>
<td>17,000</td>
</tr>
<tr>
<td>Sporting and athletic goods,</td>
<td>10,000</td>
<td>0.2</td>
<td>19.21</td>
<td>2,213</td>
<td>17,000</td>
</tr>
<tr>
<td>Manual training practice (sloyd),</td>
<td>7,000</td>
<td>0.1</td>
<td>19.21</td>
<td>2,213</td>
<td>17,000</td>
</tr>
<tr>
<td>Excelsior,</td>
<td>5,000</td>
<td>0.1</td>
<td>19.21</td>
<td>2,213</td>
<td>17,000</td>
</tr>
<tr>
<td>Clocks,</td>
<td>5,000</td>
<td>0.1</td>
<td>19.21</td>
<td>2,213</td>
<td>17,000</td>
</tr>
<tr>
<td>Elevators,</td>
<td>1,000</td>
<td>0.1</td>
<td>19.21</td>
<td>2,213</td>
<td>17,000</td>
</tr>
<tr>
<td>Ship and boat building,</td>
<td>5,100</td>
<td>0.1</td>
<td>19.21</td>
<td>2,213</td>
<td>17,000</td>
</tr>
<tr>
<td>Laundry appliances,</td>
<td>2,000</td>
<td>0.1</td>
<td>19.21</td>
<td>2,213</td>
<td>17,000</td>
</tr>
<tr>
<td>Total,</td>
<td>51,355,000</td>
<td>100.00</td>
<td>$35.22</td>
<td>$1,294,609</td>
<td>22,475,333</td>
</tr>
</tbody>
</table>

**BEECH.**

(Fagus atropunicea) = (F. grandifolia).

Considering that thirty-three industries demand beech for more than 230 distinct uses, it can properly be termed one of Pennsylvania's important hardwoods, though not many years ago it was considered by manufacturers of little value. There is but one species in Pennsylvania and its stand is abund-
ant, especially in the northeastern, northern, and western portions of the State, where are located most of the 800 or more mills that report cutting it. Pennsylvania produces more beech lumber than any other state east of the Ohio river, and in this respect stands third in importance in the United States. It is quite surprising that so large a quantity of low grade beech lumber, such as is used by the box makers, was shipped in, if one considers that the cut of this wood in Pennsylvania exceeds the consumption of home-grown wood by over 22,000,000 feet. The wood of the beech tree is not first class lumber like its associates, the maples and birches. It is usually cross-grained, not durable, difficult to season, and frequently warps and checks when in place, even after it has been thoroughly dried. It is, however, strong, hard, and moderately stiff, and these qualities combined, together with the fact that it is cheap, make it desirable for a great number of uses. It is especially adapted for turning stock and for that reason it is one of the leading woods appearing in the chair industry and in the making of brooms and mop handles. The planing mills use it largely for flooring, but for this purpose it is not in so great demand in this State as in the New England states, where a large quantity of beech shipped from Pennsylvania is used, being preferred to the New England wood owing to its better quality. The brush makers want large quantities of beech for scrubbing and other cheap brush blocks, while the woodenware and toy makers demand it in large quantities for many special uses. It is the most important wood for laundry appliances, especially for clothes pins, for which it is used probably in larger quantities in the country at large than any other wood.

Table 25.—Consumption of Beech, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity.</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>$/1,000 ft.</td>
<td>$/1,000 ft.</td>
<td>Grown in Pennsylvania</td>
</tr>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boxes and crates, packing, ...</td>
<td>12,595,839</td>
<td>31.68</td>
<td>$16.37</td>
<td>$302,272</td>
<td>3,755,339</td>
</tr>
<tr>
<td>Chairs and chair stocks, ...</td>
<td>8,430,000</td>
<td>22.92</td>
<td>17.24</td>
<td>144,945</td>
<td>7,330,000</td>
</tr>
<tr>
<td>Woodenware and novelties, ...</td>
<td>3,125,000</td>
<td>8.04</td>
<td>20.40</td>
<td>74,446</td>
<td>3,350,000</td>
</tr>
<tr>
<td>Planing mill products, ...</td>
<td>2,843,000</td>
<td>7.13</td>
<td>16.85</td>
<td>80,250</td>
<td>1,972,250</td>
</tr>
<tr>
<td>Brushes, ...</td>
<td>1,631,000</td>
<td>4.19</td>
<td>13.87</td>
<td>20,130</td>
<td>1,121,000</td>
</tr>
<tr>
<td>Handles, ...</td>
<td>1,702,000</td>
<td>4.38</td>
<td>17.31</td>
<td>22,042</td>
<td>1,305,800</td>
</tr>
<tr>
<td>Furniture, ...</td>
<td>1,452,000</td>
<td>3.74</td>
<td>16.23</td>
<td>23,034</td>
<td>1,207,000</td>
</tr>
<tr>
<td>Laundry appliances, ...</td>
<td>1,400,000</td>
<td>3.56</td>
<td>15.55</td>
<td>22,242</td>
<td>1,325,000</td>
</tr>
<tr>
<td>Car construction, ...</td>
<td>1,577,000</td>
<td>4.12</td>
<td>17.12</td>
<td>22,503</td>
<td>847,500</td>
</tr>
<tr>
<td>Frames and moulding, picture, ...</td>
<td>1,290,000</td>
<td>3.28</td>
<td>20.68</td>
<td>24,109</td>
<td>900,000</td>
</tr>
<tr>
<td>Baskets, fruit and vegetable, ...</td>
<td>1,672,000</td>
<td>4.28</td>
<td>18.02</td>
<td>20,098</td>
<td>916,000</td>
</tr>
<tr>
<td>Mine equipment, ...</td>
<td>606,525</td>
<td>1.56</td>
<td>18.04</td>
<td>11,713</td>
<td>650,525</td>
</tr>
<tr>
<td>Toys, ...</td>
<td>671,490</td>
<td>1.74</td>
<td>18.41</td>
<td>11,553</td>
<td>534,000</td>
</tr>
<tr>
<td>Vehicles and vehicle parts, ...</td>
<td>587,882</td>
<td>1.46</td>
<td>21.57</td>
<td>12,916</td>
<td>357,883</td>
</tr>
<tr>
<td>Whips, cane, and umbrella sticks, ...</td>
<td>206,500</td>
<td>.66</td>
<td>21.91</td>
<td>5,838</td>
<td>352,000</td>
</tr>
<tr>
<td>Equipment, playground, ...</td>
<td>130,000</td>
<td>.32</td>
<td>28.46</td>
<td>3,250</td>
<td>120,000</td>
</tr>
<tr>
<td>Excelsior, ...</td>
<td>116,000</td>
<td>.29</td>
<td>15.00</td>
<td>1,748</td>
<td>116,000</td>
</tr>
<tr>
<td>Dairymen's, potholders' and apiarists' supplies, ...</td>
<td>120,000</td>
<td>.25</td>
<td>16.09</td>
<td>1,690</td>
<td>120,000</td>
</tr>
<tr>
<td>Fixtures, ...</td>
<td>71,000</td>
<td>.18</td>
<td>21.85</td>
<td>1,551</td>
<td>61,000</td>
</tr>
<tr>
<td>Refrigerators and kitchen cabinets, ...</td>
<td>55,000</td>
<td>.14</td>
<td>17.36</td>
<td>955</td>
<td>20,000</td>
</tr>
</tbody>
</table>

Note: The quantities are based on the reports of the inspectors for the year ending June 30, 1912.
<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost for box factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m</td>
<td>Feet b. m</td>
<td></td>
<td>Feet b. m</td>
<td>Feet b. m</td>
</tr>
<tr>
<td>Pumps</td>
<td>50,003</td>
<td>600</td>
<td>175</td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td>Agricultural implements</td>
<td>42,000</td>
<td>65</td>
<td>400</td>
<td>2,700</td>
<td></td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>22,000</td>
<td>10</td>
<td>400</td>
<td>2,700</td>
<td></td>
</tr>
<tr>
<td>Sporting and athletic goods</td>
<td>20,000</td>
<td>10</td>
<td>500</td>
<td>2,700</td>
<td></td>
</tr>
<tr>
<td>Pulleys and conveyors</td>
<td>15,000</td>
<td>10</td>
<td>600</td>
<td>2,700</td>
<td></td>
</tr>
<tr>
<td>Rollers and poles</td>
<td>12,000</td>
<td>10</td>
<td>500</td>
<td>2,700</td>
<td></td>
</tr>
<tr>
<td>Machine construction</td>
<td>11,000</td>
<td>10</td>
<td>500</td>
<td>2,700</td>
<td></td>
</tr>
<tr>
<td>Patterns and flasks</td>
<td>10,000</td>
<td>10</td>
<td>500</td>
<td>2,700</td>
<td></td>
</tr>
<tr>
<td>Ships and boat building</td>
<td>2,500</td>
<td>10</td>
<td>500</td>
<td>2,700</td>
<td></td>
</tr>
<tr>
<td>Printing material</td>
<td>2,000</td>
<td>10</td>
<td>500</td>
<td>2,700</td>
<td></td>
</tr>
<tr>
<td>Manual training practice</td>
<td>100</td>
<td>10</td>
<td>500</td>
<td>2,700</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>175,002</td>
<td>10</td>
<td>500</td>
<td>2,700</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>40,244,300</td>
<td>100.00</td>
<td>$17,43</td>
<td>$701,244</td>
<td>$27,556,300</td>
</tr>
</tbody>
</table>

RED GUM.

(*Liquidambar styraciflua*).

Red gum in late years has grown in commercial importance more than any other domestic wood. It was formerly considered of little value, owing to difficulty in seasoning; but with the coming of improved methods of kiln-drying, both for veneer and lumber, these obstacles have been overcome and the wood has become available for a great number of uses. It was reported in Pennsylvania by twenty-three industries. The red gum tree grows in Pennsylvania, especially in the southeastern and middle portions of the State, where its cut was reported by 130 mills. It is not related, as its common name indicates, to the other gums, the water gum, and black gum, the cotton or tupelo gum, though often growing with them in the southern extension of its range. The red gum has a starlike leaf and bears its numerous seeds in spiny, round balls. The black gum has an oval leaf, and bears a small bluish black drupe containing a single seed. The wood of the red gum is fairly strong, soft and tough. It has a slightly interlocked grain, a fine, uniform texture, and takes a good polish. The color of the wood is not uniform. The sapwood is almost white and on the market is sold separately as sap gum. The heartwood is generally a reddish light brown. In some trees it is uniformly dark, while in others the dark wood runs in irregular streaks mottling the wood and giving it a figure resembling Circassian walnut. Pennsylvania furniture makers use this wood in the largest quantities, finishing it often to imitate more expensive hardwoods, mahogany, walnut, quarter-sawed oak, and cherry.
Table 26.—Consumption of Red Gum, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Boxes and crates, packing</td>
<td>12,806,054</td>
<td>56.01</td>
<td>19.68</td>
</tr>
<tr>
<td>Chairs and chair stock</td>
<td>4,330,000</td>
<td>18.92</td>
<td>25.97</td>
</tr>
<tr>
<td>Furniture</td>
<td>3,297,000</td>
<td>19.80</td>
<td>34.25</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>1,160,000</td>
<td>7.04</td>
<td>33.31</td>
</tr>
<tr>
<td>Boxes, cigar</td>
<td>549,000</td>
<td>2.41</td>
<td>49.79</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>315,000</td>
<td>1.28</td>
<td>32.37</td>
</tr>
<tr>
<td>Woodenware and novelties</td>
<td>225,000</td>
<td>0.86</td>
<td>23.50</td>
</tr>
<tr>
<td>Handles</td>
<td>196,000</td>
<td>0.85</td>
<td>19.38</td>
</tr>
<tr>
<td>Mine equipment</td>
<td>150,000</td>
<td>0.66</td>
<td>12.00</td>
</tr>
<tr>
<td>Fixtures</td>
<td>94,000</td>
<td>0.44</td>
<td>14.66</td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>50,000</td>
<td>0.22</td>
<td>51.20</td>
</tr>
<tr>
<td>Frames and moulding, picture, Brasses</td>
<td>50,000</td>
<td>0.22</td>
<td>50.00</td>
</tr>
<tr>
<td>Car construction</td>
<td>37,000</td>
<td>0.16</td>
<td>27.90</td>
</tr>
<tr>
<td>Caskets and coffins</td>
<td>35,140</td>
<td>0.15</td>
<td>27.62</td>
</tr>
<tr>
<td>Agricultural implements</td>
<td>30,000</td>
<td>0.13</td>
<td>49.00</td>
</tr>
<tr>
<td>Trunks and valises</td>
<td>21,000</td>
<td>0.11</td>
<td>36.00</td>
</tr>
<tr>
<td>Whips, canes, and umbrella sticks</td>
<td>20,000</td>
<td>0.09</td>
<td>35.00</td>
</tr>
<tr>
<td>Pipes, tobacco</td>
<td>12,000</td>
<td>0.05</td>
<td>50.00</td>
</tr>
<tr>
<td>Clocks</td>
<td>10,000</td>
<td>0.04</td>
<td>60.00</td>
</tr>
<tr>
<td>Toys</td>
<td>3,000</td>
<td>0.02</td>
<td>25.00</td>
</tr>
<tr>
<td>Refrigerators and kitchen cabinets</td>
<td>2,900</td>
<td>0.01</td>
<td>30.00</td>
</tr>
<tr>
<td>Manual training practice (sloyd)</td>
<td>470</td>
<td>0.02</td>
<td>72.34</td>
</tr>
</tbody>
</table>

Total | 22,855,144 | 100.00 | 829,842 | 5,360 | 22,855,144 |

BASSWOOD. 
*(Tilia americana).*

Probably a larger per cent. of the cut of basswood in Pennsylvania goes to the manufacturers than that of any other hardwood. Four hundred and thirty mills in 1912 report cutting over 10,000,000 feet, while the wood-using factories consumed almost 8,000,000 feet, making more than 200 distinct commodities. There is one species of basswood of commercial importance growing in Pennsylvania, and it is found in all parts of the State, but more abundantly on rich, well drained soils. It is a favorite shade tree and for that purpose is extensively planted. Lumbermen often refer to the tree as linden and call the lumber "linn," but throughout its range it is probably most commonly known as basswood. This is due to the "bast" or inner bark, which is of considerable commercial importance for making cords, ropes, and doormats. Especially in midsummer is the tree easily identified, when the fragrant yellow flowers attract the attention of the passer-by.

Basswood is the softest hardwood and in its qualities is similar to yellow poplar and aspen. This wood is stiff, light, weak, and non-durable, with an intermediate grain, wide sapwood scarcely distinguishable, and a lack of taste and odor. It is more easily worked than any of the other hardwoods, with the probable exception of yellow poplar, does not warp or check, is tough, and takes paint well. It is used by thirty-one of the wood-using factories, besides being preferred by slack cooperers over all other woods for heading, particularly flour and sugar barrels.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td></td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Furniture</td>
<td>3,954,400</td>
<td>21.18</td>
<td>$25.12</td>
<td>$138,592</td>
<td>1,105,400</td>
<td>2,840,000</td>
</tr>
<tr>
<td>Boxes and crates, packing</td>
<td>2,035,400</td>
<td>13.70</td>
<td>16.93</td>
<td>49,768</td>
<td>1,334,400</td>
<td>1,922,000</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>2,750,576</td>
<td>16.45</td>
<td>30.97</td>
<td>54,911</td>
<td>1,296,500</td>
<td>1,541,075</td>
</tr>
<tr>
<td>Toys</td>
<td>1,024,994</td>
<td>7.51</td>
<td>60.80</td>
<td>57,280</td>
<td>500,000</td>
<td>844,000</td>
</tr>
<tr>
<td>Trunks and valises</td>
<td>1,574,500</td>
<td>10.47</td>
<td>27.80</td>
<td>49,259</td>
<td>764,500</td>
<td>620,000</td>
</tr>
<tr>
<td>Woodenware and novelties</td>
<td>944,000</td>
<td>5.85</td>
<td>24.26</td>
<td>22,905</td>
<td>225,500</td>
<td>715,500</td>
</tr>
<tr>
<td>Frames and moulding, picture</td>
<td>906,000</td>
<td>5.62</td>
<td>23.09</td>
<td>20,382</td>
<td>253,000</td>
<td>750,000</td>
</tr>
<tr>
<td>Excelsior</td>
<td>129,000</td>
<td>0.80</td>
<td>13.77</td>
<td>16,319</td>
<td>175,400</td>
<td>650,000</td>
</tr>
<tr>
<td>Boxes, cigar</td>
<td>435,000</td>
<td>2.65</td>
<td>64.56</td>
<td>27,450</td>
<td>495,000</td>
<td></td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>472,500</td>
<td>2.85</td>
<td>39.10</td>
<td>14,884</td>
<td>235,500</td>
<td>218,500</td>
</tr>
<tr>
<td>Laundry appliances</td>
<td>428,000</td>
<td>2.54</td>
<td>32.52</td>
<td>14,210</td>
<td>108,500</td>
<td>328,500</td>
</tr>
<tr>
<td>Dairymen's, poulterers' and</td>
<td>270,000</td>
<td>1.63</td>
<td>18.86</td>
<td>6,050</td>
<td>370,000</td>
<td></td>
</tr>
<tr>
<td>apiculturists' supplies</td>
<td>366,001</td>
<td>2.16</td>
<td>49.74</td>
<td>14,311</td>
<td>121,211</td>
<td>225,750</td>
</tr>
<tr>
<td>Car construction</td>
<td>376,969</td>
<td>2.27</td>
<td>29.18</td>
<td>9,051</td>
<td>156,000</td>
<td>125,000</td>
</tr>
<tr>
<td>Ladders</td>
<td>231,500</td>
<td>1.41</td>
<td>42.96</td>
<td>11,040</td>
<td>201,500</td>
<td></td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>289,100</td>
<td>1.78</td>
<td>23.92</td>
<td>9,125</td>
<td>175,100</td>
<td>90,000</td>
</tr>
<tr>
<td>Fixtures</td>
<td>230,000</td>
<td>1.38</td>
<td>20.48</td>
<td>4,440</td>
<td>220,000</td>
<td></td>
</tr>
<tr>
<td>Baskets, fruit and vegetable</td>
<td>150,000</td>
<td>0.89</td>
<td>16.39</td>
<td>2,400</td>
<td>150,000</td>
<td></td>
</tr>
<tr>
<td>Ship and boat building</td>
<td>100,000</td>
<td>0.63</td>
<td>31.66</td>
<td>2,480</td>
<td>39,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Agricultural implements</td>
<td>32,000</td>
<td>0.19</td>
<td>34.96</td>
<td>1,479</td>
<td>42,300</td>
<td></td>
</tr>
<tr>
<td>Brushes</td>
<td>33,000</td>
<td>0.19</td>
<td>22.22</td>
<td>730</td>
<td>25,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Refrigerators and kitchen</td>
<td>21,600</td>
<td>0.13</td>
<td>31.11</td>
<td>672</td>
<td>1,600</td>
<td>20,000</td>
</tr>
<tr>
<td>cabinets</td>
<td>14,400</td>
<td>0.86</td>
<td>43.06</td>
<td>590</td>
<td>7,050</td>
<td>6,750</td>
</tr>
<tr>
<td>Manual training practice</td>
<td>12,000</td>
<td>0.70</td>
<td>38.48</td>
<td>406</td>
<td>5,000</td>
<td>7,500</td>
</tr>
<tr>
<td>(sloyd),</td>
<td>8,000</td>
<td>0.47</td>
<td>36.47</td>
<td>310</td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Whips, canes, and umbrella</td>
<td>5,000</td>
<td>0.30</td>
<td>69.06</td>
<td>306</td>
<td>5,000</td>
<td></td>
</tr>
<tr>
<td>sticks</td>
<td>2,000</td>
<td>0.12</td>
<td>59.69</td>
<td>111</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td>Machine construction</td>
<td>18,688,305</td>
<td>100.00</td>
<td>$29.32</td>
<td>$552,118</td>
<td>7,923,764</td>
<td>10,765,072</td>
</tr>
</tbody>
</table>

### BIRCHES.

Three species of birch are of commercial importance in Pennsylvania. They are sweet or cherry birch, in Pennsylvania often called black birch (*Betula lenta*), well distributed throughout the State; yellow birch (*Betula lutea*), found mainly on altitudes associated with beech, maple, ash, and elm; and that called red or river birch (*Betula nigra*), of little commercial importance, inhabiting the banks of streams and rivers in all parts of the State. In 1912, the cut of birch in Pennsylvania exceeded by nearly 8,000,000 feet the quantity of State-grown lumber reported by the manufacturers, these factories drawing forty-three per cent. of their requirements from the producing regions of other States, principally New York and Vermont. Sweet birch lumber can be identified by the fact that its sapwood is nearly white and its heartwood red or nearly black. It is a fine wood, hard and strong, easily worked, takes a high polish, Due, it is claimed, to the bright lining of the wood cells, and takes stains readily, which allows its use in imitation of more
expensive cabinet woods. It has an intermediate grain, is hard, dense, heavy, moderately stiff, tough and durable, rather difficult to season, hard to split, and rather easy to work. Curly birch is an accidental structure in the wood, due to cross grain corresponding to the similarly figured maples and is highly prized by cabinet makers and manufacturers of high class furniture. Yellow birch is also an excellent wood. Much of it is marketed with sweet birch without distinction. In Pennsylvania it was not possible to determine to what extent the two woods were desired for similar purposes, or for what uses the manufacturers preferred the one to the other; so accordingly they have been presented in this report under one name.

In vehicle making birch bolts are used extensively in competition with elm for hubs, and it is in this industry that the red or river birch finds its chief market. Birch lumber cut from river birch is usually of low grade and most of that used in Pennsylvania was reported by the box makers, who used birch of all species in larger amounts than any other industry. The planing mills and fixture makers demanded birch for interior trim in imitation of mahogany, and the furniture makers called for it for the same reason because it is the nearest approach to mahogany of any of the domestic woods.

Table 28.—Consumption of Birch, year ending June, 1912.

| Industry | Quantity. | | | | |
|----------|-----------|-------------------------------|-------------------------------|-------------------------------|
|          | Feet b. m. | Per cent, | Average cost per 1,000 ft. | Total cost at factory. | Feet b. m. | Feet b. m. |
| Boxes and crates, packing, | 5,990,090 | 22.19 | $16.76 | $100,558 | 2,488,500 | 3,510,500 |
| Planing mill products, | 4,450,442 | 17.51 | 34.14 | 157,003 | 2,138,444 | 2,584,588 |
| Vehicles and vehicle parts, | 1,644,580 | 6.13 | 14.11 | 72,604 | 450,000 | 1,059,500 |
| Furniture, | 1,129,276 | 4.13 | 13.40 | 51,128 | 225,500 | 312,570 |
| Laundry appliances, | 1,960,063 | 7.25 | 12.72 | 25,638 | 1,700,000 | 20,000 |
| Chairs and chair stock, | 597,400 | 2.24 | 10.65 | 28,824 | 583,500 | 400,900 |
| Fixtures, | 732,200 | 2.79 | 13.60 | 30,461 | 420,000 | 320,000 |
| Toys, | 617,000 | 2.30 | 14.84 | 14,708 | 617,000 | 617,000 |
| Woodenware and novelties, | 660,500 | 2.50 | 15.95 | 11,185 | 226,500 | 226,500 |
| Mine equipment, | 336,075 | 1.26 | 14.28 | 8,118 | 326,675 | 326,675 |
| Car construction, | 215,845 | 0.81 | 28.86 | 9,029 | 221,045 | 61,800 |
| Handles, | 207,760 | 0.79 | 18.13 | 3,706 | 205,250 | 2,500 |
| Dairymen's, poulterers' and apri- | 100,000 | 0.38 | 18.00 | 1,800 | 100,000 | 100,000 |
| ariats' supplies, | | | | | | |
| Plumbers' woodwork, | 85,000 | 0.32 | 30.95 | 2,840 | 75,000 | 30,000 |
| Instruments, musical, | 90,000 | 0.32 | 23.89 | 2,150 | 56,000 | 40,000 |
| Baskets, fruit and vegetable, | 76,000 | 0.29 | 22.43 | 1,570 | 70,000 | 70,000 |
| Refrigerators and kitchen cabi- | 65,000 | 0.24 | 25.15 | 1,625 | 30,000 | 30,000 |
| nets, | | | | | | |
| Brushes, | 51,000 | 0.19 | 14.02 | 735 | 51,000 | 51,000 |
| Pumps, | 50,000 | 0.19 | 17.00 | 850 | 50,000 | 50,000 |
| Printing material, | 20,000 | 0.07 | 30.00 | 1,500 | 16,000 | 20,000 |
| Agricultural implements, | 20,000 | 0.07 | 24.00 | 480 | 20,000 | 20,000 |
| Sleds and poles, | 12,000 | 0.05 | 14.00 | 168 | 12,000 | 12,000 |
| Pulleys and conveyors, | 10,000 | 0.04 | 20.00 | 200 | 10,000 | 10,000 |
| Frames and moulding, picture, | 7,500 | 0.03 | 70.00 | 563 | 7,500 | 7,500 |
| Clocks, | 1,000 | 0.01 | 45.00 | 180 | 1,000 | 1,000 |
| Machine construction, | 3,000 | 0.01 | 25.00 | 75 | 3,000 | 3,000 |
| Piles, tobacco, | 2,000 | 0.01 | 50.00 | 100 | 2,000 | 2,000 |
| Caskets and coffins, | 1,000 | 0.01 | 24.00 | 24 | 1,000 | 1,000 |
| Miscellaneous, | 25,000 | 0.98 | 14.00 | 350 | 25,000 | 25,000 |
| Total, | 18,635,582 | 100.00 | $22.05 | $522,774 | 9,826,614 | 8,586,965 |
THE HICKORIES.

Two industries in Pennsylvania, vehicle parts and handles, together use nearly five-sixths of the 18,000,000 feet of hickory going into products of final manufacture. The remainder is divided in varying small amounts among eighteen industries, of which car building, making of mine sprags, and machine construction are the principal ones. On account of the variety of special uses for which hickory is demanded, a large amount of waste is occasioned, both in the preparation of the raw material as well as in the finished commodity. This waste probably exceeds that of any other valuable hardwood.

Six species of hickory grow in Pennsylvania and some of them are found more or less generally throughout the State. In the tree they can be readily identified by their botanical characteristics, but when cut into lumber the species are difficult to distinguish. The information available to guide in their separation was so meager that they are therefore presented in this report under the generic name hickory. The growing scarcity of hickory, together with the fact that no suitable substitutes have been found for it in a number of its special uses, accounts for the high average price the manufacturers paid for it. Apart from its scarcity, the wood is a most valuable one, owing to its combination of qualities of extraordinary hardness, strength, toughness, and flexibility. No such combination exists in any other domestic hardwood. Further, it has a straight grain, is moderately elastic, hard to split, and very perishable; it is a difficult wood to season and to work and to be made to hold its shape.

Table 29.—Consumption of Hickory, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet m.</td>
<td>Per cent.</td>
<td>Feet m.</td>
<td>Feet m.</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>10,819,552</td>
<td>60.60</td>
<td>$38.51</td>
<td>$324,805</td>
</tr>
<tr>
<td>Handles</td>
<td>2,677,356</td>
<td>22.26</td>
<td>31.95</td>
<td>137,645</td>
</tr>
<tr>
<td>Car construction</td>
<td>1,145,336</td>
<td>9.25</td>
<td>34.50</td>
<td>34,352</td>
</tr>
<tr>
<td>Mine equipment</td>
<td>816,353</td>
<td>6.71</td>
<td>12.51</td>
<td>11,031</td>
</tr>
<tr>
<td>Machine construction</td>
<td>696,900</td>
<td>5.81</td>
<td>27.27</td>
<td>19,663</td>
</tr>
<tr>
<td>Agricultural implements</td>
<td>124,400</td>
<td>1.07</td>
<td>33.41</td>
<td>4,156</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>50,100</td>
<td>0.45</td>
<td>27.02</td>
<td>2,365</td>
</tr>
<tr>
<td>Shuttles, spools, and bobbins</td>
<td>33,400</td>
<td>0.33</td>
<td>46.58</td>
<td>2,969</td>
</tr>
<tr>
<td>Butchers’ blocks and skewers</td>
<td>56,000</td>
<td>0.28</td>
<td>18.00</td>
<td>980</td>
</tr>
<tr>
<td>Ship and boat building</td>
<td>28,900</td>
<td>0.16</td>
<td>65.00</td>
<td>1,820</td>
</tr>
<tr>
<td>Whips, canes, and umbrella sticks</td>
<td>26,000</td>
<td>0.15</td>
<td>55.85</td>
<td>1,432</td>
</tr>
<tr>
<td>Ladders</td>
<td>25,000</td>
<td>0.13</td>
<td>15.00</td>
<td>4,500</td>
</tr>
<tr>
<td>Chairs and chair stock</td>
<td>15,000</td>
<td>0.10</td>
<td>17.20</td>
<td>258</td>
</tr>
<tr>
<td>Saddles and harness</td>
<td>10,000</td>
<td>0.06</td>
<td>90.00</td>
<td>600</td>
</tr>
<tr>
<td>Rollers and poles</td>
<td>2,500</td>
<td>0.01</td>
<td>60.00</td>
<td>150</td>
</tr>
<tr>
<td>Woodenware and novelties</td>
<td>2,500</td>
<td>0.01</td>
<td>60.00</td>
<td>150</td>
</tr>
<tr>
<td>Fixtures</td>
<td>1,000</td>
<td>0.01</td>
<td>65.00</td>
<td>65</td>
</tr>
<tr>
<td>Manual training process (loyd)</td>
<td>924</td>
<td>0.01</td>
<td>70.66</td>
<td>64</td>
</tr>
<tr>
<td>Furniture</td>
<td>750</td>
<td>0.01</td>
<td>81.33</td>
<td>61</td>
</tr>
<tr>
<td>Printing material</td>
<td>500</td>
<td>0.01</td>
<td>50.60</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>17,832,256</td>
<td>106.09</td>
<td>$40.59</td>
<td>$724,635</td>
</tr>
</tbody>
</table>
THE ASHES.

Ash is one of the most widely distributed of the North American trees. It ranges from the Rocky Mountain states eastward through every state but Maine, and the fact that 606 Pennsylvania sawmills in 1912 reported cutting this wood, indicates that the tree is also well distributed throughout this State. Manufacturers do not distinguish the species for particular uses but, like the oaks, they separate them into classes, white ash and black ash. In Pennsylvania the white ash (Fraxinus americana) and black ash (Fraxinus nigra) are the most important commercial species of ash growing within the State and they make up the bulk of the material which the Pennsylvania manufacturers consume. The white ash is one of Pennsylvania's valuable hardwoods. It possesses a coarse, straight grain, fine texture, is moderately hard and strong, besides being rather resilient and tough. However, it lacks durability. The manufacture of vehicle parts, handles, agricultural implements, boats, sporting goods, and framework of various kinds where the qualities of strength and toughness are desired call principally for white ash, both in Pennsylvania and the country at large.

The uses of black ash are quite different from those of the white ash because of its different qualities. It is much softer, not as strong or as elastic, and is more durable. Black ash has a pronounced attractive figure and is more desirable for decorative work. It is, therefore, called on to meet large demands for interior finish of houses, railroad and trolley cars. The lack of taste and odor makes ash valuable for containers of foodstuffs, such as butter tubs, woodenware, flour barrels, and boxes of various kinds. Only forty-six per cent of the ash going into further manufacture was State-grown, in spite of the fact that the lumber cut exceeded by over 4,000,000 feet the amount of home-grown material used.

Table 30.—Consumption of Ash, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost at factory, per 1,000 ft.</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car construction</td>
<td>4,296,915</td>
<td>39.74</td>
<td>$249,311</td>
<td>923,996</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>3,500,472</td>
<td>25.16</td>
<td>158,564</td>
<td>2,066,294</td>
</tr>
<tr>
<td>Handles,</td>
<td>1,898,740</td>
<td>13.77</td>
<td>56,052</td>
<td>1,139,750</td>
</tr>
<tr>
<td>Planing mill products,</td>
<td>794,315</td>
<td>5.35</td>
<td>41,962</td>
<td>353,165</td>
</tr>
<tr>
<td>Furniture,</td>
<td>634,540</td>
<td>4.43</td>
<td>19,462</td>
<td>259,380</td>
</tr>
<tr>
<td>Agricultural implements,</td>
<td>599,140</td>
<td>4.19</td>
<td>23,202</td>
<td>106,419</td>
</tr>
<tr>
<td>Dairyman’s, poultry’s and apiculture’s supplies,</td>
<td>400,600</td>
<td>2.93</td>
<td>6,000</td>
<td>295,000</td>
</tr>
<tr>
<td>Ship and boat building,</td>
<td>388,700</td>
<td>2.72</td>
<td>16,118</td>
<td>265,700</td>
</tr>
<tr>
<td>Toys,</td>
<td>329,000</td>
<td>2.24</td>
<td>13,450</td>
<td>182,500</td>
</tr>
<tr>
<td>Furniture,</td>
<td>173,500</td>
<td>1.23</td>
<td>4,969</td>
<td>82,560</td>
</tr>
<tr>
<td>Plumbers’ woodwork,</td>
<td>110,000</td>
<td>0.77</td>
<td>2,740</td>
<td>110,000</td>
</tr>
<tr>
<td>Chairs and chair stock,</td>
<td>104,200</td>
<td>0.73</td>
<td>2,550</td>
<td>37,700</td>
</tr>
<tr>
<td>Saddles and harnesses,</td>
<td>160,000</td>
<td>0.79</td>
<td>4,480</td>
<td>76,000</td>
</tr>
<tr>
<td>Elevators,</td>
<td>90,000</td>
<td>0.65</td>
<td>6,640</td>
<td>45,000</td>
</tr>
<tr>
<td>Trunks and valises,</td>
<td>87,400</td>
<td>0.61</td>
<td>3,187</td>
<td>87,400</td>
</tr>
<tr>
<td>Machine construction,</td>
<td>83,000</td>
<td>0.58</td>
<td>3,725</td>
<td>5,000</td>
</tr>
<tr>
<td>Equipment, playground,</td>
<td>75,000</td>
<td>0.52</td>
<td>2,475</td>
<td>37,260</td>
</tr>
<tr>
<td>Boxes and crates, packing,</td>
<td>54,200</td>
<td>0.38</td>
<td>1,274</td>
<td>50,500</td>
</tr>
<tr>
<td>Fixtures,</td>
<td>49,500</td>
<td>0.35</td>
<td>2,825</td>
<td>41,000</td>
</tr>
<tr>
<td>Mine equipment,</td>
<td>42,400</td>
<td>0.30</td>
<td>3,550</td>
<td>42,400</td>
</tr>
</tbody>
</table>
Table 30—Concluded.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet b. m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerators and kitchen cabinets</td>
<td>32,000</td>
<td>.22</td>
<td>39.19</td>
<td>1,222</td>
<td>4,000</td>
<td>28,000</td>
</tr>
<tr>
<td>Baskets, fruit and vegetable</td>
<td>35,000</td>
<td>.21</td>
<td>21.00</td>
<td>678</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>Sporting and athletic goods</td>
<td>30,000</td>
<td>.21</td>
<td>66.82</td>
<td>2,005</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>Machinery and apparatus, electrical</td>
<td>25,000</td>
<td>.17</td>
<td>68.00</td>
<td>1,500</td>
<td></td>
<td>25,000</td>
</tr>
<tr>
<td>Instruments, professional and scientific</td>
<td>15,000</td>
<td>.10</td>
<td>58.67</td>
<td>850</td>
<td>5,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Pulleys and conveyors</td>
<td>17,000</td>
<td>.10</td>
<td>33.00</td>
<td>450</td>
<td>7,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Brushes</td>
<td>12,000</td>
<td>.09</td>
<td>34.29</td>
<td>432</td>
<td>12,000</td>
<td></td>
</tr>
<tr>
<td>Frames and moulding, picture</td>
<td>10,000</td>
<td>.07</td>
<td>35.00</td>
<td>250</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Rollers and poles</td>
<td>8,150</td>
<td>.04</td>
<td>22.68</td>
<td>201</td>
<td>5,000</td>
<td>1,150</td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>8,300</td>
<td>.04</td>
<td>44.34</td>
<td>235</td>
<td>5,000</td>
<td>300</td>
</tr>
<tr>
<td>Ladders</td>
<td>4,000</td>
<td>.03</td>
<td>70.00</td>
<td>280</td>
<td>4,000</td>
<td></td>
</tr>
<tr>
<td>Manual training practice (sloyd)</td>
<td>1,100</td>
<td>.01</td>
<td>70.91</td>
<td>78</td>
<td>300</td>
<td>500</td>
</tr>
<tr>
<td>Laundry appliances</td>
<td>1,000</td>
<td>.01</td>
<td>25.00</td>
<td>25</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Weighing apparatus</td>
<td>500</td>
<td>.01</td>
<td>90.00</td>
<td>81</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>50,000</td>
<td>.05</td>
<td>25.00</td>
<td>1,250</td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14,304,627</td>
<td>.00</td>
<td>$41.02</td>
<td>$629,752</td>
<td>6,568,862</td>
<td>7,735,675</td>
</tr>
</tbody>
</table>

45.92% in. 54.08% out.

THE ELMS.

Only two species of elm were reported by the Pennsylvania wood users, white elm (*Ulmus americana*) and cork elm (*Ulmus racemosa*); but it is possible that small quantities of slippery elm (*Ulmus pubescens* = *U. fulva*) were used, but because it is cut in this State in only small quantities it is usually marketed mixed with white elm and, therefore, was not identified and reported separately. Cork elm is the most valuable of the three elms because the wood is most durable, but white elm in Pennsylvania is the most abundant species and composes the largest proportion of the 3,000,000 feet of elm that the Pennsylvania sawmills cut in 1912. Elm, irrespective of species, is one of the strongest and most elastic hardwoods growing in Pennsylvania. In addition to being heavy, tough, hard, and dense, it is hard to work and difficult to season. The two species reported are together demanded by 16 industries. The largest amount of the cork elm went to the vehicle maker, while the chair industry was foremost in demanding the white elm. The trunk makers also bid for a large amount of this wood for slat material.
Table 31.—Consumption of Elm*, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Per cent</th>
<th>Average cost per 1,000 ft. at factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Chairs and chair stock,</td>
<td>6,232,500</td>
<td>59.85</td>
<td>$25.76</td>
<td>$165,243</td>
<td>62,000</td>
</tr>
<tr>
<td>Trunks and valises,</td>
<td>1,837,500</td>
<td>17.70</td>
<td>25.82</td>
<td>66,625</td>
<td>256,000</td>
</tr>
<tr>
<td>Dairymen’s, poulterers’ and apiarists’ supplies,</td>
<td>600,000</td>
<td>5.78</td>
<td>25.00</td>
<td>15,000</td>
<td>250,000</td>
</tr>
<tr>
<td>Woodenware and novelties,</td>
<td>500,000</td>
<td>4.83</td>
<td>28.00</td>
<td>14,000</td>
<td>500,000</td>
</tr>
<tr>
<td>Vehicles and vehicle parts,</td>
<td>494,400</td>
<td>4.71</td>
<td>25.92</td>
<td>17,308</td>
<td>95,800</td>
</tr>
<tr>
<td>Boxes and crates, packing,</td>
<td>429,800</td>
<td>4.14</td>
<td>20.40</td>
<td>10,400</td>
<td>133,200</td>
</tr>
<tr>
<td>Baskets and veneer packages for fruit and vegetables,</td>
<td>115,000</td>
<td>1.11</td>
<td>21.87</td>
<td>2,545</td>
<td>115,000</td>
</tr>
<tr>
<td>Car construction,</td>
<td>61,248</td>
<td>.61</td>
<td>40.43</td>
<td>2,131</td>
<td></td>
</tr>
<tr>
<td>Agricultural implements,</td>
<td>50,000</td>
<td>.48</td>
<td>25.00</td>
<td>1,250</td>
<td>50,000</td>
</tr>
<tr>
<td>Elevators,</td>
<td>52,500</td>
<td>.51</td>
<td>64.98</td>
<td>2,113</td>
<td>20,500</td>
</tr>
<tr>
<td>Toys,</td>
<td>25,000</td>
<td>.24</td>
<td>21.60</td>
<td>625</td>
<td>12,500</td>
</tr>
<tr>
<td>Patterns and blanks,</td>
<td>15,000</td>
<td>.14</td>
<td>28.00</td>
<td>485</td>
<td>15,000</td>
</tr>
<tr>
<td>Mine equipment,</td>
<td>8,800</td>
<td>.08</td>
<td>56.14</td>
<td>230</td>
<td>8,800</td>
</tr>
<tr>
<td>Planing mill products,</td>
<td>4,000</td>
<td>.04</td>
<td>28.00</td>
<td>90</td>
<td>4,000</td>
</tr>
<tr>
<td>Machine construction,</td>
<td>2,000</td>
<td>.02</td>
<td>50.00</td>
<td>100</td>
<td>2,000</td>
</tr>
<tr>
<td>Total,</td>
<td>10,380,812</td>
<td>100.00</td>
<td>$27.95</td>
<td>$280,116</td>
<td>1,000,900</td>
</tr>
</tbody>
</table>

*The white and cork elm groups have been combined in this table.
In Part II of this report the information is given separately.

COTTONWOOD.

(Populus deltoides).

Cottonwood belongs to a widely distributed tree family, which includes the willows, aspen, balm of gilead, and other poplars (not yellow poplar). The cottonwood referred to in this report is the Populus deltoides, the tree found in large sizes and most abundant in the lower Mississippi Valley. It grows in moist soil in almost all the states east of the Rocky Mountains. Owing to the difficulty in seasoning cottonwood, it is better adapted for veneer than lumber. Yellow and white cottonwood are often distinguished in trade. The former refers to the heartwood, the latter to the light colored sapwood of the tree. However, the amount consumed for veneer production in the United States is only about 10 per cent. of the lumber cut. The manufacturers of built up lumber used this wood in large amounts as veneer. On account of its qualities of toughness, flexibility, and its capacity for being easily worked, it is especially adapted for bent work as in vehicle bodies and auditorium chairs. It is also popular with trunk makers for trunk boxes and tops. The lumber serves many uses as a substitute for basswood and yellow poplar, and, like these woods, is light, weak, and non-durable; but of fine even texture and a lack of taste and odor. The last two named qualities commend it as a material for food containers, while for packing cases and crates its other excellent qualities, combined with its whitish color, make it especially desirable as a background for printing and stenciling. This tree is not commonly cut in Pennsylvania, which accounts for the fact that only about one and one-half per cent. of the total amount used was State-grown. Eleven industries
together demand over six and one-third million feet of cottonwood, of which 74 per cent. is used by the box industry, nearly 8 per cent. for laundry appliances, and 6 per cent. by the furniture makers.

Table 32.—Consumption of Cottonwood, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Boxes and crates, packing.</td>
<td>4,850,000</td>
<td>73.96</td>
<td>$24.69</td>
<td>$115,135</td>
<td>40,000</td>
</tr>
<tr>
<td>Laundry appliances.</td>
<td>500,000</td>
<td>7.89</td>
<td>32.90</td>
<td>16,450</td>
<td>500,000</td>
</tr>
<tr>
<td>Furniture.</td>
<td>380,000</td>
<td>6.00</td>
<td>34.87</td>
<td>12,250</td>
<td>300,000</td>
</tr>
<tr>
<td>Planing mill products.</td>
<td>320,000</td>
<td>5.21</td>
<td>35.36</td>
<td>8,370</td>
<td>230,000</td>
</tr>
<tr>
<td>Trunks and valises.</td>
<td>175,350</td>
<td>2.90</td>
<td>37.86</td>
<td>6,731</td>
<td>175,350</td>
</tr>
<tr>
<td>Refrigerators and kitchen cabinets.</td>
<td>150,000</td>
<td>2.37</td>
<td>33.00</td>
<td>4,800</td>
<td>150,000</td>
</tr>
<tr>
<td>Vehicles and vehicle parts.</td>
<td>64,000</td>
<td>1.01</td>
<td>34.76</td>
<td>2,200</td>
<td>40,000</td>
</tr>
<tr>
<td>Fixtures.</td>
<td>49,000</td>
<td>.63</td>
<td>35.50</td>
<td>1,740</td>
<td>29,000</td>
</tr>
<tr>
<td>Sporting and athletic goods.</td>
<td>10,000</td>
<td>.16</td>
<td>33.00</td>
<td>320</td>
<td>10,000</td>
</tr>
<tr>
<td>Dairymen’s, poulterers’ and apiarists’ supplies.</td>
<td>2,500</td>
<td>.04</td>
<td>49.60</td>
<td>160</td>
<td>2,500</td>
</tr>
<tr>
<td>Pulleys and conveyors.</td>
<td>2,000</td>
<td>.03</td>
<td>21.00</td>
<td>42</td>
<td>2,000</td>
</tr>
<tr>
<td><strong>Total.</strong></td>
<td>6,355,850</td>
<td>100.00</td>
<td>$26.06</td>
<td>$185,938</td>
<td>85,500</td>
</tr>
</tbody>
</table>

THE GUMS.

Black gum is the common name given in various states to three trees, black or sour gum (Nyssa sylvatica), cotton gum or tupelo (Nyssa aquatica), and water gum (Nyssa biflora), all belonging to the dogwood family. Red gum, though it bears the name of “gum” does not belong to the same family and, therefore, has been discussed under a separate heading. One of the above named species, the black or sour gum, grows within the State. It is found in wet lowlands and along the slopes of the foothills and mountains. It is not abundant and only a little over 5 per cent. of the total of nearly 5,000,000 feet used by 11 industries is State-grown wood. It attracts attention by its bright green summer foliage, which in the autumn turns to brilliant yellow and red, and also by its clusters of two or three oblong berries of bluish black color and sour taste. The wood of this tree has an interlaced fiber and is difficult to split and work; hence it is valuable for certain special uses, such as vehicle hubs, pulleys, mine rollers, mauls, mallets, and cogs. In the South it is cut into veneer and goes into wooden dishes, berry cups, fruit baskets, and veneer boxes.
Table 33.—Consumption of Black Gum, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Boxes and crates, packing</td>
<td>3,083,869</td>
<td>62.33</td>
<td>$15.36</td>
</tr>
<tr>
<td>Mine equipment</td>
<td>1,028,460</td>
<td>32.35</td>
<td>24.37</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>181,860</td>
<td>5.67</td>
<td>22.00</td>
</tr>
<tr>
<td>Baskets, fruit and vegetable</td>
<td>20,000</td>
<td>0.64</td>
<td>22.00</td>
</tr>
<tr>
<td>Pulleys and conveyors</td>
<td>14,900</td>
<td>0.46</td>
<td>27.71</td>
</tr>
<tr>
<td>Instruments, professional and scientific</td>
<td>12,000</td>
<td>0.24</td>
<td>52.33</td>
</tr>
<tr>
<td>Rollers and poles</td>
<td>6,000</td>
<td>0.12</td>
<td>20.00</td>
</tr>
<tr>
<td>Ship and boat building</td>
<td>3,000</td>
<td>0.06</td>
<td>70.00</td>
</tr>
<tr>
<td>Fixtures</td>
<td>1,000</td>
<td>0.02</td>
<td>35.00</td>
</tr>
<tr>
<td>Car construction</td>
<td>600</td>
<td>0.01</td>
<td>58.00</td>
</tr>
<tr>
<td>Patterns and daks</td>
<td>500</td>
<td>0.01</td>
<td>24.00</td>
</tr>
<tr>
<td>Total</td>
<td>4,957,160</td>
<td>100.00</td>
<td>$19.34</td>
</tr>
</tbody>
</table>

Cotton Gum (Nyssa aquatica).

Most of the cotton gum or tupelo lumber came from Virginia and the Carolinas. It grows only on the swamps and lowlands and in lumber can be distinguished from the black (sour) gum by its darker yellowish hue, its tendency to split straight, besides being soft and more easily worked. Nearly 6,000,000 feet of this wood is demanded by eight industries. The box makers use most of it. Cigar box material also claims a fairly large amount. The two industries together consume 92 per cent. of the total.

Table 34.—Consumption of Cotton Gum, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Boxes and crates</td>
<td>3,458,722</td>
<td>58.05</td>
<td>$14.13</td>
</tr>
<tr>
<td>Boxes, cigar</td>
<td>2,042,842</td>
<td>34.31</td>
<td>22.37</td>
</tr>
<tr>
<td>Furniture</td>
<td>230,500</td>
<td>3.97</td>
<td>33.04</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>151,648</td>
<td>2.54</td>
<td>26.55</td>
</tr>
<tr>
<td>Agricultural implements</td>
<td>55,000</td>
<td>0.99</td>
<td>36.09</td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>20,000</td>
<td>0.34</td>
<td>25.00</td>
</tr>
<tr>
<td>Woodenware and novelties</td>
<td>6,000</td>
<td>0.12</td>
<td>20.00</td>
</tr>
<tr>
<td>Toys</td>
<td>2,000</td>
<td>0.06</td>
<td>20.00</td>
</tr>
<tr>
<td>Total</td>
<td>5,957,687</td>
<td>100.00</td>
<td>$32.29</td>
</tr>
</tbody>
</table>
CHERRY.
(Prunus serotina).

In the lumber cut of cherry, Pennsylvania is second only to West Virginia. Notwithstanding the fact that the production of cherry in Pennsylvania is nearly 5,000,000 feet more than the consumption, one-third of the requirements of the manufacturers was supplied by the forests of other states. Black cherry is the only cherry species used commercially. Its technical quality is high in that it combines strength and hardness, a fine straight grain, compact structure, and stability. It also takes a fine polish and excels most other hardwoods in its capacity to hold its shape. It is this quality which commends it for electrotype backing. In Pennsylvania this is its chief use. The car manufacturers give it preference over any other domestic wood for the best grade interior finish of passenger coaches. It is a favorite with the fixture and furniture manufacturers. The qualities, in addition to those mentioned above, are durability, stiffness, density, and ease in splitting. It is somewhat brittle, with a fine, straight grain.

Table 35.—Consumption of Black Cherry, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Printing material</td>
<td>1,188,860</td>
<td>42.84</td>
<td>$20.14</td>
</tr>
<tr>
<td>Brushes</td>
<td>452,900</td>
<td>17.73</td>
<td>25.45</td>
</tr>
<tr>
<td>Car construction</td>
<td>421,114</td>
<td>15.84</td>
<td>69.59</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>477,856</td>
<td>6.51</td>
<td>64.45</td>
</tr>
<tr>
<td>Fixtures</td>
<td>123,700</td>
<td>4.73</td>
<td>66.14</td>
</tr>
<tr>
<td>Furniture</td>
<td>118,500</td>
<td>4.38</td>
<td>34.74</td>
</tr>
<tr>
<td>Patterns and blanks</td>
<td>56,594</td>
<td>3.19</td>
<td>71.55</td>
</tr>
<tr>
<td>Foxes and crates, packing</td>
<td>70,000</td>
<td>2.57</td>
<td>15.69</td>
</tr>
<tr>
<td>Caskets and coffins</td>
<td>50,000</td>
<td>2.73</td>
<td>60.69</td>
</tr>
<tr>
<td>Instruments, professional and</td>
<td>26,000</td>
<td>.73</td>
<td>60.09</td>
</tr>
<tr>
<td>scientific</td>
<td>10,600</td>
<td>.37</td>
<td>100.00</td>
</tr>
<tr>
<td>Handles</td>
<td>46,000</td>
<td>.28</td>
<td>50.50</td>
</tr>
<tr>
<td>Refrigerators and kitchen</td>
<td>7,500</td>
<td>.23</td>
<td>62.50</td>
</tr>
<tr>
<td>cabinets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weighing apparatus</td>
<td>7,500</td>
<td>.28</td>
<td>27.00</td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>5,400</td>
<td>.16</td>
<td>75.68</td>
</tr>
<tr>
<td>Plumbers' woodwork</td>
<td>4,800</td>
<td>.16</td>
<td>94.55</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>2,250</td>
<td>.08</td>
<td>91.56</td>
</tr>
<tr>
<td>Manual training practice</td>
<td>1,500</td>
<td>.07</td>
<td>55.68</td>
</tr>
<tr>
<td>(sloyd)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sporting and athletic goods</td>
<td>100</td>
<td></td>
<td>46.00</td>
</tr>
<tr>
<td>Total</td>
<td>2,732,492</td>
<td>100.00</td>
<td>$30.73</td>
</tr>
</tbody>
</table>

BLACK WALNUT.
(Juglans nigra).

The cut of black walnut in Pennsylvania is equal to three times the total consumed by the factories and five times the quantity of the home grown wood that they report. Black walnut is the most expensive hardwood native to Pennsylvania and was demanded by 17 industries. It is very durable, easy to work, hard, porous, strong, stiff, heavy, stable in place, non-elastic, and with an intermediate straight grain. The makers of caskets and coffins used
the most, followed by the manufacturers of organs and furniture, using nearly equal quantities, and by 14 other industries demanding varying smaller amounts.

Table 36.—Consumption of Black Walnut, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost 1,000,000 ft.</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caskets and coffins</td>
<td>214,000</td>
<td>$50.50</td>
<td>$10,722</td>
<td>122,000</td>
<td>32,000</td>
</tr>
<tr>
<td>Instruments, musical</td>
<td>121,200</td>
<td>45.77</td>
<td>5,577</td>
<td>47,200</td>
<td>12,500</td>
</tr>
<tr>
<td>Furniture</td>
<td>120,000</td>
<td>55.04</td>
<td>6,635</td>
<td>21,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>72,265</td>
<td>111.31</td>
<td>8,000</td>
<td>52,365</td>
<td>24,000</td>
</tr>
<tr>
<td>Car construction</td>
<td>56,800</td>
<td>101.13</td>
<td>5,583</td>
<td>950</td>
<td>55,910</td>
</tr>
<tr>
<td>Chairs and chair stock</td>
<td>50,000</td>
<td>66.68</td>
<td>3,304</td>
<td>44,000</td>
<td>9,000</td>
</tr>
<tr>
<td>Fixtures</td>
<td>35,000</td>
<td>83.21</td>
<td>2,973</td>
<td>28,500</td>
<td>7,000</td>
</tr>
<tr>
<td>Clocks</td>
<td>21,600</td>
<td>50.95</td>
<td>1,070</td>
<td>21,000</td>
<td></td>
</tr>
<tr>
<td>Patterns and flasks</td>
<td>14,500</td>
<td>50.69</td>
<td>725</td>
<td>4,500</td>
<td>10,000</td>
</tr>
<tr>
<td>Frames and mouldings, picture</td>
<td>10,500</td>
<td>50.67</td>
<td>547</td>
<td>4,500</td>
<td>6,000</td>
</tr>
<tr>
<td>Machinery and apparatus, electrical,</td>
<td>2,500</td>
<td>40.60</td>
<td>100</td>
<td>2,500</td>
<td></td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>1,400</td>
<td>81.45</td>
<td>128</td>
<td>1,100</td>
<td>300</td>
</tr>
<tr>
<td>Handles</td>
<td>1,050</td>
<td>81.90</td>
<td>88</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Brushes</td>
<td>1,000</td>
<td>80.60</td>
<td>80</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Manual training practice (sloyd)</td>
<td>850</td>
<td>87.06</td>
<td>77</td>
<td>850</td>
<td>200</td>
</tr>
<tr>
<td>Plumbers' woodwork</td>
<td>34,500</td>
<td>71.81</td>
<td>2,456</td>
<td>10,200</td>
<td>24,000</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>200</td>
<td>35.00</td>
<td>10</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>782,615</td>
<td>109.06</td>
<td>33,765</td>
<td>432,700</td>
<td>338,910</td>
</tr>
</tbody>
</table>

SYCAMORE.

(*Platanus occidentalis*).

Not more than 4 1/2 per cent. of the requirements of the Pennsylvania wood-users was drawn from the State-grown sycamore. This is not surprising, as this species is not an important lumber tree in this State. Sycamore's fine grain revealed by rift sawing and its rich color commend its use for cabinet work. It has a coarse, distinct grain, somewhat contorted, and is hard, heavy, stiff, hard to split, moderately strong and durable, difficult to season and to work, and unstable in holding its shape. Forty-two mills report it, but only in small quantities. Probably the most exacting use of this wood in the country at large is for butcher blocks, but in Pennsylvania none of the manufacturers report using it for that purpose. The chair makers demanded the most that was used, almost 72 per cent. of the total, while the rest was about equally distributed among five other industries, the brush makers being the most important.
Table 37.—Consumption of Sycamore, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Pounds cost per 1,000 feet.</td>
</tr>
<tr>
<td>Chairs and chair stock,</td>
<td>560,600</td>
<td>71.72</td>
<td>$35.00</td>
</tr>
<tr>
<td>Brushes</td>
<td>71,650</td>
<td>9.49</td>
<td>43.80</td>
</tr>
<tr>
<td>Furniture</td>
<td>66,170</td>
<td>8.43</td>
<td>38.80</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>20,300</td>
<td>2.61</td>
<td>45.72</td>
</tr>
<tr>
<td>Ship and boat building</td>
<td>20,600</td>
<td>2.61</td>
<td>65.00</td>
</tr>
<tr>
<td>Boxes and crates, packing</td>
<td>11,603</td>
<td>1.50</td>
<td>16.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>697,763</td>
<td>100.00</td>
<td><strong>$20,030</strong></td>
</tr>
</tbody>
</table>

HORNBEAM.

(Ostrya virginiana).

Hornbeam is frequently called ironwood because of its great weight and strength. It has an intermediate grain, is somewhat contorted, is very hard and dense, tough, stiff, durable, and difficult to split, besides being heavy, difficult to season and hard to work, but capable of wearing smooth by use. The wood being heavy, tough, and resilient, is used extensively by the handle makers and the manufacturers of vehicle parts. Its other uses in this State are for mine sprags and for sides of cheese boxes. It is possible that the material reported for the last named use may have been blue beech (Carpinus caroliniana), which is also called ironwood and closely resembles hornbeam. Nearly three-fourths of the total amount of the material that is used was supplied by the State, while of that coming from a distance a part was supplied by Canadian forests.

Table 38.—Consumption of Hornbeam, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Pounds cost per 1,000 feet.</td>
</tr>
<tr>
<td>Handles</td>
<td>410,000</td>
<td>75.02</td>
<td>$49.28</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>100,000</td>
<td>18.75</td>
<td>30.00</td>
</tr>
<tr>
<td>Mine equipment (sprags)</td>
<td>21,000</td>
<td>3.91</td>
<td>15.14</td>
</tr>
<tr>
<td>Dairymen's, poulterers', and</td>
<td>10,000</td>
<td>1.81</td>
<td>12.00</td>
</tr>
<tr>
<td>apiculturists' supplies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>547,184</td>
<td>100.00</td>
<td><strong>$22,085</strong></td>
</tr>
</tbody>
</table>
BLACK LOCUST.
(Robinia pseudacacia—R. Pseu-do-Acacia).

All the black locust used by the Pennsylvania manufacturers was grown in the State, and in quantity was equal to more than one-tenth of the total lumber cut of locust in the United States. This was because the wood is demanded for uses which usually require raw material in the forms of billets and bolts, and it is an exception that it leaves the sawmills in the form of planks or boards. Only three industries use this wood in Pennsylvania and two of them cut it into billet form. They are the makers of insulator pins, brackets, and mine sprags. The third industry, vehicle part manufacture, purchases locust in bolt form and uses it for wagon hubs. This species has the distinction of being the most durable native hardwood both in the open when exposed and in contact with the ground, thus accounting for its extensive demand for fence posts. It has a coarse, straight grain, is hard, porous, heavy, and tough, splits easily, holds its shape well, and easily turned.

Table 39.—Consumption of Black Locust, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Insulator pins and brackets</td>
<td>463,503</td>
<td>91.68</td>
<td>$29.98</td>
</tr>
<tr>
<td>Mine equipment (sprags)</td>
<td>31,350</td>
<td>6.20</td>
<td>10.18</td>
</tr>
<tr>
<td>Vehicles and vehicle parts</td>
<td>11,000</td>
<td>2.17</td>
<td>18.78</td>
</tr>
<tr>
<td>Total</td>
<td>506,850</td>
<td>100.00</td>
<td>$29.98</td>
</tr>
</tbody>
</table>

CUCUMBER.
(Magnolia acuminata).

This tree frequents the mountain slopes and grows to large and symmetrical dimensions. It is a member of the magnolia family, which includes the yellow poplar. It derives its name from the similarity in form and appearance of its fruit cone to the cucumber. The appearance and technical quality of the wood so resemble yellow poplar and the uses of the two are so nearly identical that as a rule they are marketed together without distinction. Owing to this fact it is probable that the manufacturers use more cucumber than the table shows, and it also accounts for Pennsylvania's not being included with West Virginia and Virginia in the production of this kind of lumber. The principal industries using this wood are planing mill products and boxes.
Table 40.—Consumption of Cucumber, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft</td>
</tr>
<tr>
<td>Planing mill products</td>
<td>277,300</td>
<td>76.47</td>
<td>$27.00</td>
</tr>
<tr>
<td>Boxes and crates,</td>
<td>70,000</td>
<td>18.92</td>
<td>17.00</td>
</tr>
<tr>
<td>Pulleys and conveyors</td>
<td>10,400</td>
<td>2.68</td>
<td>18.60</td>
</tr>
<tr>
<td>Vehicles and vehicle parts,</td>
<td>4,800</td>
<td>1.28</td>
<td>25.00</td>
</tr>
<tr>
<td>Agricultural Implements,</td>
<td>2,000</td>
<td>.53</td>
<td>20.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>314,400</td>
<td>100.00</td>
<td><strong>$24.73</strong></td>
</tr>
</tbody>
</table>

BUCKEYE.

Buckeye, like cucumber, often loses its identity and goes to market mixed with yellow poplar. It is called for separately by the manufacturers of artificial limbs to meet what may probably be termed its most exacting use, but for this purpose was not reported in Pennsylvania. The wood is light, soft, cross grained, compact, and difficult to split. The color is creamy white and so uniform that the sapwood can hardly be distinguished from the heartwood. Two species of buckeye are native to Pennsylvania, the fetid buckeye (*Aesculus glabra*) and the yellow or sweet buckeye (*Aesculus octandra*). The western part of this State is the eastern limit of both species and it is impossible to ascertain the quantity of each that the manufacturers use. This wood is more evenly distributed among the various classes of manufacture calling for it than any other shown in this report.

Table 41.—Consumption of Buckeye, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft</td>
</tr>
<tr>
<td>Laundry appliances,</td>
<td>125,000</td>
<td>35.56</td>
<td>$28.00</td>
</tr>
<tr>
<td>Woodenware and novelties,</td>
<td>41,700</td>
<td>32.83</td>
<td>$25.00</td>
</tr>
<tr>
<td>Boxes and crates, packing,</td>
<td>30,500</td>
<td>24.92</td>
<td>20.71</td>
</tr>
<tr>
<td>Planing mill products,</td>
<td>35,000</td>
<td>10.73</td>
<td>29.71</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>241,200</td>
<td>100.00</td>
<td>$25.19</td>
</tr>
</tbody>
</table>

$100,000
APPLEWOOD.
(Pyrus species).

This wood may be of many species and is consumed in larger quantities in Pennsylvania than in any other state in which reports similar to this have been made. It is demanded for a few special purposes, the manufacture of smoking pipes being the most important, while under the heading of printing material, it is used for wood type. As in other states, it is used for making carpenters' tools, particularly handsaw handles.

Table 42.—Consumption of Applewood, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet bare m.</td>
<td>Per cent</td>
<td>Feet bare m.</td>
<td>Feet bare m.</td>
<td>Feet bare m.</td>
</tr>
<tr>
<td>Pipes, smoking</td>
<td>121,425</td>
<td>70.42 $52.42</td>
<td>61,435</td>
<td>60,000</td>
</tr>
<tr>
<td>Handles</td>
<td>56,000</td>
<td>28.00 $40.00</td>
<td>25,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Handles</td>
<td>1,000</td>
<td>.58 50.00</td>
<td>50</td>
<td>1,000</td>
</tr>
<tr>
<td>Total</td>
<td>172,425</td>
<td>100.00 $48.84</td>
<td>87,425</td>
<td>85,000</td>
</tr>
</tbody>
</table>

DOGWOOD.
(Cornus florida).

Nearly all of the dogwood going into final manufacture in Pennsylvania was grown in the State. It is exceedingly hard, strong, of compact structure, and tough, and these qualities together with its ability to wear smooth give it preference over any other wood in the manufacture of shuttles, and commend it for mine sprags. These two industries use 95 per cent. of the total amount reported. Three other industries use the remainder.

Table 43.—Consumption of Dogwood, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet bare m.</td>
<td>Per cent</td>
<td>Feet bare m.</td>
<td>Feet bare m.</td>
<td>Feet bare m.</td>
</tr>
<tr>
<td>Mine equipment (sprags)</td>
<td>129,088</td>
<td>84.74 $15.72</td>
<td>129,088</td>
<td></td>
</tr>
<tr>
<td>Shuttles, spools, and bobbins</td>
<td>17,585</td>
<td>10.71 69.60</td>
<td>17,585</td>
<td></td>
</tr>
<tr>
<td>Instruments, scientific and professional</td>
<td>7,200</td>
<td>4.39 28.47</td>
<td>277</td>
<td>1,000</td>
</tr>
<tr>
<td>Handles</td>
<td>340</td>
<td>.14 67.57</td>
<td>340</td>
<td>340</td>
</tr>
<tr>
<td>Manual training practice (slotted)</td>
<td>54</td>
<td>.01 90.00</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>164,137</td>
<td>100.00 $25.59</td>
<td>140,122</td>
<td>24,015</td>
</tr>
</tbody>
</table>
PERSIMMON.

(Diospyros virginiana).

The persimmon tree belongs to the ebony family which is confined largely to tropical regions. The wood has all the good qualities of ash, works more smoothly, and retains a friction polish. Besides it has a very fine, rather straight grain, and is hard, strong, tough, porous, very heavy, and splits easily. Persimmon has two important uses for which there is extensive demand, last-blocks for children's shoes, and shuttles used in textile mills. In the country at large, the greatest quantity probably goes to the latter industry, but in Pennsylvania the makers of boot and shoe findings used all but 12½ per cent. of the quantity consumed.

Table 44.—Consumption of Persimmon, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>1,000 ft.</th>
<th>Average cost at factory</th>
<th>Total cost</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boot and shoe findings,...............................</td>
<td>99,000</td>
<td>87.68</td>
<td>39.19</td>
<td>5,860</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shuttles, spools and bobbins,........................</td>
<td>7,600</td>
<td>6.29</td>
<td>60.86</td>
<td>421</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handles,...............................................</td>
<td>6,000</td>
<td>6.29</td>
<td>51.00</td>
<td>378</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total,..................................................</td>
<td>112,600</td>
<td>100.00</td>
<td>38.82</td>
<td>6,659</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BUTTERNUT.

(Juglans cinerea).

Butternut is relatively common on good soil in Pennsylvania. It is used by a greater number of industries in this State than in any other. Nearly 92 per cent. of the total quantity used in Pennsylvania is grown in the State. The most surprising fact in connection with the use of this wood is the consumption of butternut for excelsior at the low price of $15 per thousand feet. The excelsior makers used more than one-third of all reported, while the fixture manufacturers, the ship builders, and the manufacturers of pulleys were the next in importance, these four industries together consuming 74 per cent. of the total. The rest went to four other industries in varying small amounts. Butternut is often called white walnut. Its qualities include porousness, brittleness, stiffness, lack of resiliency, capacity to split, easy to work, and it is considerably lighter, weaker, and less durable than black walnut.
Table 45.—Consumption of Butternut, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Excelsior,</td>
<td>20,000</td>
<td>34.56</td>
<td>$15.00</td>
</tr>
<tr>
<td>Fixtures</td>
<td>13,500</td>
<td>21.55</td>
<td>$44.30</td>
</tr>
<tr>
<td>Ship and boat building,</td>
<td>10,000</td>
<td>11.52</td>
<td>$30.00</td>
</tr>
<tr>
<td>Pulleys and conveyors,</td>
<td>10,000</td>
<td>11.52</td>
<td>$29.00</td>
</tr>
<tr>
<td>Planing mill products,</td>
<td>9,500</td>
<td>11.52</td>
<td>$30.21</td>
</tr>
<tr>
<td>Patterns and blanks,</td>
<td>5,200</td>
<td>6.92</td>
<td>$76.32</td>
</tr>
<tr>
<td>Boxes and crates, packing,</td>
<td>5,000</td>
<td>5.76</td>
<td>16.60</td>
</tr>
<tr>
<td>Furniture,</td>
<td>3,500</td>
<td>4.03</td>
<td>26.61</td>
</tr>
<tr>
<td>Total</td>
<td>88,810</td>
<td>100.00</td>
<td>$33.72</td>
</tr>
</tbody>
</table>

MINOR SPECIES.

Domestic woods used in only small amounts, and not of sufficient importance to discuss separately, are as follows: Holly (American), used by the novelty makers, brought in from the southern Mississippi Valley; State-grown aspen (popple), used for excelsior; willow for woodenware, likewise produced in the State; home-grown mountain laurel used by the furniture makers; and sassafras cut in Maryland and purchased by the ship builders.

FOREIGN WOODS.

This term is employed to cover all woods brought into Pennsylvania from foreign countries other than Canada. There are ten of them and Spanish cedar in quantity is the most important.

Only two states have shown so large a consumption of Spanish cedar as Pennsylvania. Nearly 6,000,000 feet is consumed annually and comes principally from the West Indies and Mexico. This tree is not a softwood like the native cedars, nor is it related. It has broad leaves, confining its range to the tropical countries. Its aromatic odor, pleasing color, and lightness, together with the fact that it holds its shape and is easily worked, make it the favorite cigar box wood. Boat builders and furniture makers in Pennsylvania also report this wood in small quantities.

Over 3,500,000 feet of mahogany is brought into the State each year. The furniture makers use the largest amount, although 17 other classes of manufacturers demand it for raw material, and seven of them in quantities exceeding 100,000 feet. The supply of true mahogany comes from Mexico, the West Indies, Central America, and a few states in South America, but it was not possible in any way to ascertain which of these countries supplied the Pennsylvania factories, as mahogany lumber is purchased from American dealers who import the logs and cut them in this country.

Ebony comes next as to quantity among the imported woods and surpasses the consumption of this wood in any other state. The most is used for umbrella handles although the demand for smoking pipe material is also considerable. There are many species of ebony and they are found in various countries. Probably the kind coming from Madagascar and India is used most commonly in this country.
Boxwood comes to this country from Turkey and the West Indies. From the high average price paid for that used in Pennsylvania, it is safe to conclude that most of it was Turkish wood which is much more costly. Boxwood was imported into this State to make shuttles for silk weaving and to furnish material for wood engravings.

Teakwood, strong and very hard, and with a smooth oily texture, is imported from Ceylon, Siam, and India, and in Pennsylvania the entire supply went to two industries, ship building and patterns.

Circassian walnut grows in the mountains in southern Russia near the Black Sea. While very expensive, it is held in high favor in this country for furniture, store, office, and bar fixtures, and cabinet work. It is nearly always used as veneer with a backing or core of an inexpensive native wood.

The olive wood went to the smoking pipe manufacturers. It was brought from France in the form of billets.

Rosewood was the highest priced wood that was purchased in the form of lumber by the Pennsylvania manufacturers. It is a native of Central America and the northern states of South America.

Lignum-vitae was imported in log or in bolt form from practically the same region as rosewood. It is a wood of special value on account of its extraordinary weight and strength. Bowling balls are turned from this wood after long and careful seasoning.

The eucalyptus used in Pennsylvania comes from Australia and goes to the furniture makers. The eucalyptus grown in the United States is not valued for so many uses as is the imported wood.

**Description of Qualities.**

*Grain:* Very coarse, coarse, intermediate, fine, very fine.

*Width of sapwood:* Very narrow, narrow, medium, wide.

*Hardness:* Very hard, hard, fairly* hard, soft, very soft.

*Density:* Dense, fairly dense, slightly porous, porous, very porous.

*Weight:* Very light, light, medium, moderately* heavy, heavy, very heavy.

*Strength:* Very strong, strong, moderately strong, weak.

*Flexibility and stiffness:* Very stiff, stiff, moderately stiff, fairly flexible, flexible, very flexible.

*Elasticity:* Very elastic, elastic, moderately elastic, non-elastic.

*Toughness and Brittleness:* Very tough, tough, moderately tough, slightly brittle, brittle, very brittle.

*Tendency to Split:* Splits easily, splits rather easily, hard to split, very hard to split.

*Durability:* Very durable, durable, moderately durable, perishable, very perishable.

*Stability in Holding Shape:* Stable, moderately stable, unstable, very unstable.

*Working Quality:* Very easy to work, easy to work, fairly hard to work, hard to work.

*Fairly and moderately have the same value in the scale of terms.*
PART II.

INDUSTRIES.

The kinds of wood the Pennsylvania manufacturers demand, their botanical relations, their sources, and their qualities, have been discussed in Part I. In Part II are considered the factories using the different woods, and the processes of manufacture that they employ; the extent to which they call for them, and the uses to which they put them according to inherent qualities. For convenience the discussions are divided into classes called industries and those making similar or closely related commodities are grouped together. In Pennsylvania there are 51, and Table 46 following shows how the more than 1,100,000,000 feet of lumber yearly manufactured in the State is apportioned among them. The largest industry requires nearly 280,000,000 feet of raw material, 14 others more than 10,000,000 each, and the smallest less than 100,000. A few other industries which could not be separated because the factories composing them numbered fewer than three, have been grouped in one industry under miscellaneous. To maintain uniformity the same order in classification as has been adopted to other states has been followed in Pennsylvania. Their order has been arranged according to the total quantity used and is as follows:

Table 46.—Summary by Industries of Woods used in Pennsylvania, year ending June, 1912.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Plating mill products,</td>
<td>281,717,000</td>
<td>25.28</td>
<td>$38.46</td>
</tr>
<tr>
<td>Car construction,</td>
<td>229,399,000</td>
<td>20.50</td>
<td>20.52</td>
</tr>
<tr>
<td>Furniture,</td>
<td>16,555,170</td>
<td>1.55</td>
<td>25.34</td>
</tr>
<tr>
<td>Chairs and chair stock,</td>
<td>23,117,000</td>
<td>2.17</td>
<td>25.34</td>
</tr>
<tr>
<td>Vehicles and vehicle parts,</td>
<td>31,891,369</td>
<td>2.95</td>
<td>42.63</td>
</tr>
<tr>
<td>Ship and boat building,</td>
<td>38,216,000</td>
<td>2.40</td>
<td>35.44</td>
</tr>
<tr>
<td>Caskets and coffins,</td>
<td>12,895,000</td>
<td>1.26</td>
<td>28.77</td>
</tr>
<tr>
<td>Mine equipment,</td>
<td>11,348,867</td>
<td>1.07</td>
<td>19.53</td>
</tr>
<tr>
<td>Fixtures,</td>
<td>11,888,000</td>
<td>1.07</td>
<td>42.20</td>
</tr>
<tr>
<td>Boards—cloth, hoselry, etc.,</td>
<td>17,175,000</td>
<td>1.66</td>
<td>26.60</td>
</tr>
<tr>
<td>Pattern and flats,</td>
<td>11,955,311</td>
<td>1.08</td>
<td>51.20</td>
</tr>
<tr>
<td>Handles,</td>
<td>11,614,000</td>
<td>1.05</td>
<td>26.05</td>
</tr>
<tr>
<td>Laundry appliances,</td>
<td>16,755,709</td>
<td>1.57</td>
<td>22.17</td>
</tr>
<tr>
<td>Boxes, cigar,</td>
<td>9,990,750</td>
<td>0.93</td>
<td>29.77</td>
</tr>
<tr>
<td>Woodwareen and novelties,</td>
<td>5,574,730</td>
<td>0.57</td>
<td>22.69</td>
</tr>
<tr>
<td>Tanks and silos,</td>
<td>7,763,500</td>
<td>0.71</td>
<td>26.07</td>
</tr>
<tr>
<td>Machine construction,</td>
<td>7,016,000</td>
<td>0.63</td>
<td>20.23</td>
</tr>
<tr>
<td>Agricultural implements,</td>
<td>7,091,000</td>
<td>0.63</td>
<td>20.34</td>
</tr>
<tr>
<td>Toys,</td>
<td>6,421,500</td>
<td>0.63</td>
<td>25.37</td>
</tr>
<tr>
<td>Trunks and values,</td>
<td>4,130,500</td>
<td>0.45</td>
<td>26.73</td>
</tr>
<tr>
<td>Brushes,</td>
<td>4,067,000</td>
<td>0.40</td>
<td>22.34</td>
</tr>
<tr>
<td>Shuttles, spoons, and bobbins,</td>
<td>3,347,500</td>
<td>0.39</td>
<td>27.14</td>
</tr>
<tr>
<td>Dairymen's, poultrymen and apiarists' supplies,</td>
<td>3,298,450</td>
<td>0.39</td>
<td>23.82</td>
</tr>
<tr>
<td>Instruments, musical,</td>
<td>2,945,000</td>
<td>0.26</td>
<td>39.33</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-----------</td>
<td>-----------</td>
<td>---------------------------</td>
</tr>
<tr>
<td></td>
<td>Feet h. m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machinery and apparatus, electrical</td>
<td>2,715,200</td>
<td>.24</td>
<td>31.54</td>
</tr>
<tr>
<td>Pumps</td>
<td>2,692,600</td>
<td>.24</td>
<td>34.89</td>
</tr>
<tr>
<td>Baskets and veneer packages for fruit</td>
<td>2,632,000</td>
<td>.24</td>
<td>19.44</td>
</tr>
<tr>
<td>and vegetables</td>
<td>2,619,000</td>
<td>.24</td>
<td>26.00</td>
</tr>
<tr>
<td>Frames and moulding, picture,</td>
<td>2,463,800</td>
<td>.22</td>
<td>30.73</td>
</tr>
<tr>
<td>Refrigerators and kitchen cabinets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excelsior</td>
<td>1,692,000</td>
<td>.15</td>
<td>14.28</td>
</tr>
<tr>
<td>Equipment, playground</td>
<td>1,607,000</td>
<td>.14</td>
<td>20.01</td>
</tr>
<tr>
<td>Printing material</td>
<td>1,274,600</td>
<td>.11</td>
<td>20.27</td>
</tr>
<tr>
<td>Ladders</td>
<td>1,168,500</td>
<td>.10</td>
<td>39.16</td>
</tr>
<tr>
<td>Elevators</td>
<td>1,005,900</td>
<td>.08</td>
<td>42.00</td>
</tr>
<tr>
<td>Whips, canes, and umbrella sticks</td>
<td>588,850</td>
<td>.06</td>
<td>63.50</td>
</tr>
<tr>
<td>Plumbers' woodwork</td>
<td>584,250</td>
<td>.05</td>
<td>10.45</td>
</tr>
<tr>
<td>Insulator pins and brackets</td>
<td>578,500</td>
<td>.05</td>
<td>21.65</td>
</tr>
<tr>
<td>Butchers' blocks and skewers</td>
<td>529,300</td>
<td>.05</td>
<td>29.77</td>
</tr>
<tr>
<td>Weighting apparatus</td>
<td>505,400</td>
<td>.04</td>
<td>34.50</td>
</tr>
<tr>
<td>Instruments, professional and scientific</td>
<td>326,148</td>
<td>.02</td>
<td>37.44</td>
</tr>
<tr>
<td>Pulleys and conveyors</td>
<td>294,050</td>
<td>.02</td>
<td>39.30</td>
</tr>
<tr>
<td>Boot and shoe findings</td>
<td>265,000</td>
<td>.02</td>
<td>51.31</td>
</tr>
<tr>
<td>Pipes, tobacco</td>
<td>227,248</td>
<td>.02</td>
<td>165.49</td>
</tr>
<tr>
<td>Sporting and athletic goods</td>
<td>210,150</td>
<td>.02</td>
<td>38.76</td>
</tr>
<tr>
<td>Saddles and harness</td>
<td>116,000</td>
<td>.01</td>
<td>55.32</td>
</tr>
<tr>
<td>Gates and fencing</td>
<td>116,000</td>
<td>.01</td>
<td>22.58</td>
</tr>
<tr>
<td>Clocks</td>
<td>112,500</td>
<td>.01</td>
<td>65.69</td>
</tr>
<tr>
<td>Rollers and curtain poles (school)</td>
<td>125,357</td>
<td>.01</td>
<td>18.77</td>
</tr>
<tr>
<td>M a n u a l Training practice (loyd)</td>
<td>95,455</td>
<td>.01</td>
<td>66.44</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>7,416,353</td>
<td>.07</td>
<td>26.99</td>
</tr>
<tr>
<td>Total</td>
<td>1,144,219,650</td>
<td>100.09</td>
<td>$289.15</td>
</tr>
</tbody>
</table>

In the consumption of wood four classes of factories in Pennsylvania lead all other states: brushes, patterns and flashes, toys, and mine equipment; in seven others the State stood second; car construction, printing material, caskets and coffins, laundry appliances, playground equipment, machine construction, and tobacco pipes. The State was third in box making and the manufacture of wooden clock cases. Excelsior factories, manufacturers of insulator pins and brackets, and the makers of butcher blocks and skewers were the only industries procuring all of their wood from the forests of the State. Nineteen others use a larger amount of State-grown than shipped-in material, leaving 29 that find the major portion of their wood supply out of the State, every industry reported the purchase of some Pennsylvania wood. It is surprising that the box makers, who use only low grades, used more shipped-in material than any other industry, while on the other hand, the handle makers, who usually seek their raw material over a wide extent of territory, procured considerably over two-thirds of their needs within the State.

Nearly $32,500,000 are annually expended by the Pennsylvania wood users for raw material. Not over 20 per cent. of this is paid for home-grown woods,
leaving not less than $25,000,000, a large portion of which each year goes to other states. In a great many cases this purchase money could be expended at home, since it is quite evident that the State is not manufacturing as much of its annual cut as is possible. On the succeeding pages the several industries are considered separately in the order of the quantity of wood consumed.

**PLANING MILL PRODUCTS.**

The extent to which lumber is used in Pennsylvania in the manufacture of building materials is shown statistically in Table 47. This does not, of course, include large quantities of rough lumber used for construction which needs no further change than the hatchet, chisel, and saw to fit it to place on the building. The factories grouped into this industry include four classes. (1) Factories specializing in the manufacture of sash, doors, and blinds or any one of these commodities. Formerly these products were made by small mills operating in nearly every town and city in Pennsylvania doing a general planing mill business but within recent years specialty manufacturing in enormous quantities has demonstrated that these commodities can be manufactured, distributed, and sold cheaper than they can be made at home in small quantities. (2) Factories producing only planing mill products or the more universal commodities kept in stock like flooring, ceiling, siding, stock finish, etc. Planing mills operated in connection with large sawmills are the principal source of these commodities but portable mills having planers and local sash and door factories also produce large quantities. In this class are included mills specializing in the manufacture of hardwood flooring which in Pennsylvania is an important industry, also parquetry flooring. (3) There are planing mills and builders' factories engaged in the general planing mill business. This class is the most numerous and widely distributed over the State. They manufacture chiefly according to special design and usually for local consumption. Included in their production are special size sash, doors, blinds, and in small quantities floorings, ceiling, etc., besides material for window and door frames, stair work, cupboards, mantels, panel work, colonnades, grills, and all exterior and interior house finish. A number of factories belonging to this class are formidable industries, especially those located in cities. (4) Industries other than wood-using that maintain a woodworking shop equipped to manufacture various commodities like those mentioned above for their own needs and mainly for the repair and upkeep of their own plant. Steel mills, collieries, railroad companies, textile mills, and various other large manufacturing enterprises are examples.

Over 25 per cent. of the lumber cut of the United States is demanded for manufacturing products belonging to this industry and more wood and a greater number of kinds goes into this line of manufacture than into any other. It is not surprising, therefore, that these same facts apply to Pennsylvania and that in this report the planing mill industry as to quantity leads all others. The table following lists the kinds and amounts of woods used but in no manner does it represent all the lumber required in the State in this line.

Forty-four kinds of wood were reported by the factories grouped under this industry which is the largest number making up any of the forty-eight industries comprising this report. This can probably be explained by the many and varied uses of lumber for building purposes in which operations range as in Pennsylvania from the construction of a rude shanty to expensive palatial residences.

An examination of the list of woods in the table shows that a number of the species used in large amounts do not grow plentifully in the State. The Pacific coast states furnished a considerable quantity, including western white
pine, western yellow pine, redwood, Douglas fir, western red cedar, Sitka spruce, and sugar pine. The region of the southern states contributed large amounts, equivalent to 34 per cent. of all, including more particularly the several species of southern yellow pine lumber and cypress. The Ohio valley, the Lake states, and New England, sent in varying amounts, which explains the comparatively small quantity of home-grown woods used by the planing mills. It must be remembered, however, a large number of these species are not common lumber trees in Pennsylvania.

Only 28 per cent. of the total amount of lumber used was produced in the State. But of the species consumed that are plentifully cut in Pennsylvania, the reports show the demand for a high per cent. of home-grown woods. For instance, over 45 per cent. of the white pine, 67 per cent. of the hemlock, one-third of the chestnut, 80 per cent. of the sugar maple and beech, 60 per cent. of the birch, and half of the basswood reported by the planing mills, were cut from State timber, indicating the importance the forests bear to the development of the State. The planing mill industry is not only the most prominent wood consuming industry in the State but it appeals more widely to the interest of every class of citizens than any other. In order that the supply of lumber the State contributes for building material may be maintained and probably increased in the future, it is necessary to protect and improve the forests as far as possible. With this in view the Commonwealth has put into effect and has in operation a progressive forest policy which if given popular support will help to solve the problem of future lumber supply.

**Table 47.—Wood for Planing Mill Products, year ending June, 1912.**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per.</td>
<td></td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>White pine</td>
<td>62,556,492</td>
<td>22.21</td>
<td>$29.53</td>
<td>$2,296,287</td>
<td>29,261,290</td>
<td>29,259,188</td>
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<tr>
<td>Shortleaf pine</td>
<td>21,707,560</td>
<td>15.41</td>
<td>26.68</td>
<td>1,832,738</td>
<td>15,249,360</td>
<td>17,731,100</td>
</tr>
<tr>
<td>Hemlock</td>
<td>23,077,600</td>
<td>8.10</td>
<td>21.21</td>
<td>490,263</td>
<td>35,249,360</td>
<td>7,600,360</td>
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<tr>
<td>Longleaf pine</td>
<td>19,612,680</td>
<td>6.66</td>
<td>29.29</td>
<td>567,370</td>
<td>29,261,290</td>
<td>19,612,280</td>
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<tr>
<td>Cypress (bald)</td>
<td>18,769,280</td>
<td>6.67</td>
<td>39.68</td>
<td>715,412</td>
<td>18,769,280</td>
<td></td>
</tr>
<tr>
<td>Chestnut</td>
<td>17,409,372</td>
<td>6.18</td>
<td>27.65</td>
<td>656,450</td>
<td>3,150,700</td>
<td>11,563,650</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>17,120,322</td>
<td>6.08</td>
<td>37.38</td>
<td>640,042</td>
<td>4,127,560</td>
<td>12,595,822</td>
</tr>
<tr>
<td>Red oak</td>
<td>16,603,645</td>
<td>5.71</td>
<td>41.73</td>
<td>671,551</td>
<td>6,482,450</td>
<td>5,906,598</td>
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<tr>
<td>White oak</td>
<td>15,714,725</td>
<td>5.87</td>
<td>46.75</td>
<td>641,363</td>
<td>4,225,660</td>
<td>9,256,772</td>
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<tr>
<td>Sugar maple</td>
<td>9,881,589</td>
<td>3.44</td>
<td>23.75</td>
<td>229,963</td>
<td>8,478,650</td>
<td>1,086,960</td>
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<tr>
<td>Loblolly pine</td>
<td>7,267,069</td>
<td>2.59</td>
<td>27.52</td>
<td>201,074</td>
<td>7,267,069</td>
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</tr>
<tr>
<td>Birch</td>
<td>4,093,415</td>
<td>1.60</td>
<td>30.54</td>
<td>179,663</td>
<td>1,283,844</td>
<td>3,224,588</td>
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<tr>
<td>Western white pine</td>
<td>2,914,500</td>
<td>1.03</td>
<td>39.55</td>
<td>155,281</td>
<td>2,914,500</td>
<td></td>
</tr>
<tr>
<td>Pitch pine</td>
<td>2,834,060</td>
<td>1.06</td>
<td>32.37</td>
<td>63,296</td>
<td>2,834,060</td>
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<tr>
<td>Basswood</td>
<td>2,725,576</td>
<td>0.97</td>
<td>39.97</td>
<td>84,581</td>
<td>1,926,990</td>
<td>1,341,676</td>
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<tr>
<td>Beech</td>
<td>2,464,790</td>
<td>0.87</td>
<td>16.35</td>
<td>40,259</td>
<td>1,927,290</td>
<td>489,569</td>
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<td>Spruce</td>
<td>1,999,254</td>
<td>0.71</td>
<td>29.96</td>
<td>59,904</td>
<td>176,350</td>
<td>1,822,584</td>
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<tr>
<td>Red gum</td>
<td>1,610,300</td>
<td>0.57</td>
<td>31.31</td>
<td>56,122</td>
<td>1,610,300</td>
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<tr>
<td>Sugar pine</td>
<td>1,021,090</td>
<td>0.38</td>
<td>28.20</td>
<td>54,678</td>
<td>1,021,090</td>
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<tr>
<td>Ash</td>
<td>791,426</td>
<td>0.28</td>
<td>31.59</td>
<td>41,062</td>
<td>338,165</td>
<td>258,150</td>
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<tr>
<td>Mahogany</td>
<td>716,969</td>
<td>0.25</td>
<td>15.92</td>
<td>114,512</td>
<td>716,969</td>
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<tr>
<td>Norway pine</td>
<td>552,600</td>
<td>0.19</td>
<td>29.20</td>
<td>15,267</td>
<td>552,600</td>
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<tr>
<td>Cottonwood</td>
<td>250,000</td>
<td>0.09</td>
<td>25.56</td>
<td>6,770</td>
<td>250,000</td>
<td></td>
</tr>
<tr>
<td>Western yellow pine</td>
<td>230,000</td>
<td>0.08</td>
<td>31.94</td>
<td>11,180</td>
<td>230,000</td>
<td></td>
</tr>
<tr>
<td>Cucumber</td>
<td>267,300</td>
<td>0.10</td>
<td>27.00</td>
<td>7,217</td>
<td>225,300</td>
<td>42,000</td>
</tr>
</tbody>
</table>
Fig. 3.—Box shooks and nailing machine in a Pennsylvania box factory.

Fig. 4.—Interior of a small Philadelphia box factory. Boxes when nailed are used for city trade.
<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Feet b. m.</th>
<th>Per cent</th>
<th>Average cost per 1,000 ft.</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red cedar</td>
<td>213,000</td>
<td>.06</td>
<td>49.27</td>
<td>10,495</td>
<td>10,000</td>
<td>208,000</td>
</tr>
<tr>
<td>Redwood</td>
<td>197,132</td>
<td>.07</td>
<td>49.19</td>
<td>9,697</td>
<td>197,132</td>
<td></td>
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<tr>
<td>Cherry (black)</td>
<td>177,285</td>
<td>.06</td>
<td>64.48</td>
<td>11,483</td>
<td>119,065</td>
<td>67,200</td>
</tr>
<tr>
<td>Cotton ginn</td>
<td>153,648</td>
<td>.06</td>
<td>26.55</td>
<td>4,927</td>
<td>153,648</td>
<td></td>
</tr>
<tr>
<td>Douglas fir</td>
<td>108,560</td>
<td>.04</td>
<td>43.33</td>
<td>4,701</td>
<td>108,560</td>
<td></td>
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<tr>
<td>Hickory</td>
<td>59,100</td>
<td>.03</td>
<td>27.03</td>
<td>2,165</td>
<td>70,100</td>
<td>10,000</td>
</tr>
<tr>
<td>Black walnut</td>
<td>77,256</td>
<td>.03</td>
<td>111.31</td>
<td>5,800</td>
<td>52,365</td>
<td>24,890</td>
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<tr>
<td>Red and silver maple</td>
<td>71,750</td>
<td>.03</td>
<td>26.19</td>
<td>1,579</td>
<td>21,750</td>
<td>49,000</td>
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<tr>
<td>Scrub pine</td>
<td>70,000</td>
<td>.02</td>
<td>29.50</td>
<td>1,435</td>
<td>25,000</td>
<td>45,000</td>
</tr>
<tr>
<td>Western red cedar</td>
<td>55,000</td>
<td>.02</td>
<td>39.09</td>
<td>2,150</td>
<td>55,000</td>
<td></td>
</tr>
<tr>
<td>Balsam fir</td>
<td>40,000</td>
<td>.01</td>
<td>45.50</td>
<td>1,820</td>
<td>40,000</td>
<td></td>
</tr>
<tr>
<td>Yellow buckeye</td>
<td>35,000</td>
<td>.01</td>
<td>29.71</td>
<td>725</td>
<td>19,000</td>
<td>16,000</td>
</tr>
<tr>
<td>Tamarack</td>
<td>29,000</td>
<td>.01</td>
<td>33.00</td>
<td>600</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>Sycamore</td>
<td>28,300</td>
<td>.01</td>
<td>45.72</td>
<td>1,294</td>
<td>17,000</td>
<td>11,500</td>
</tr>
<tr>
<td>Sitka spruce</td>
<td>15,000</td>
<td>.01</td>
<td>35.40</td>
<td>531</td>
<td></td>
<td>15,000</td>
</tr>
<tr>
<td>Butternut</td>
<td>9,600</td>
<td>*</td>
<td>39.71</td>
<td>256</td>
<td>6,600</td>
<td>3,000</td>
</tr>
<tr>
<td>White elm</td>
<td>4,000</td>
<td>*</td>
<td>28.00</td>
<td>92</td>
<td>4,000</td>
<td></td>
</tr>
<tr>
<td>Southern white cedar</td>
<td>1,000</td>
<td>*</td>
<td>120.00</td>
<td>120</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Circassian walnut</td>
<td>500</td>
<td>*</td>
<td>25.00</td>
<td>125</td>
<td></td>
<td>500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>281,717,900</strong></td>
<td><strong>109.09</strong></td>
<td><strong>$9,427,936</strong></td>
<td><strong>83,652,088</strong></td>
<td><strong>198,065,512</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Less than 1-100 of 1 per cent.

BOXES.

Next to building material, more wood goes for making boxes and crates in Pennsylvania than for any other use. Over six hundred factories reported the information collated in Table 48. Not more than half of these were regular box manufacturers, as is shown by the list of names in the appendix. There are included glass factories, steel mills, refractories, machinery manufacturers, makers of electrical apparatus, foundries, furniture makers, silk and textile mills, paper factories, large jobbing and department stores, etc., which maintain box departments for making packages and shipping containers to meet their own requirements. The uses of boxes are so numerous in Pennsylvania that it is not practical to attempt to mention or list them. Generally it can be said they are of two kinds, set-up boxes and box shooks. The former includes the nailed, the reinforced, the veneer, the locked corner, and dovetailed, or boxes that are sold ready to use. The nailed box is usually sold in the locality in which it is made. It is rarely shipped put together. The large number of this kind accounted for in Pennsylvania was principally in the large cities where there is an extensive demand or else near to factories and mills using the wooden packages. The reinforced box is a nailed box, the nailed joints and often the body of the box being reinforced with cleats, wire, or steel bands. These are used for shipping ponderous materials where the package is subjected to great strain. Of late this method has also become popular for containers for light materials, including large boxes for millinery, etc., when only very thin resawed material about three-eighths to one-fourth inch is used and the necessary strength supplied by the cleats. Re-shippers belong to this class, most frequently reinforced with steel bands.
They are box crates for carrying back and forth bottled goods and are made of strong material. All that are used in Pennsylvania are not made in the State. Many are shipped from Maryland, Delaware and Virginia.

The veneer box has recently made remarkable progress. The question of saving in weight and the revenue from the sale of second hand boxes, which lately is being given considerable attention by shippers, has helped the veneer package. The single ply box, wire bound, competes actively with the fiber shipping box but the progress these have made is not so surprising as that of the three ply veneer box. In these the sides, top, and bottom are panels built of three sheets of veneer with the grain transversing and well supported with cleats of thick material. The panels are not only strong and light in weight but the appearance of the single piece sides makes an attractive package. The glue pot enters as an important factor in their manufacture as a good glue joint is the most essential requirement, and, if assured, panel making is simple and makes both for economy and efficiency. Many more of these boxes are shipped into Pennsylvania knocked down than are made in the State. The panel makers are largely in the south where the stands of cheap veneer woods, principally the gums, are easily accessible.

White pine and basswood are the woods for dovetailed and locked corner boxes and large quantities are annually demanded for their making. These are small size containers but probably present the most attractive appearance of any form of wooden packages. They are used for articles of food, powdered substances, jewelry, etc., as the close joints make them more dust and moisture proof. The dovetailed box requires no gluing but the locked corner does. Both kinds are made in Pennsylvania, the latter in the largest quantities. Boxes with the bevel joint corner are not made any more in large quantities. Only a few manufacturers in Pennsylvania reported them.

Shooks are knocked down boxes sold conveniently bundled to facilitate their being assembled and nailed. Different from nailed boxes made and sold in the same region, shooks are manufactured close to the source of the raw material and sent over long distances to consuming centers. A large part of the boxes used in Pennsylvania, but not made there, are bought in in shook form. Shook making includes both shooks for boxes and knock-down crates. Rough lumber of any thickness or kind used to do for crating, and the lumber yard rather than the box factory was the source of the supply. Today the manufacturer shipping his wares in crates desires to express as much character in his package as do those using box containers. In consequence, the shook makers are called on for neat and attractively designed crates and like shooks they are sold with the several parts bundled together, due attention having been given to the size, kind, and thickness of the material in accordance with the weight and character of the goods to be shipped in them.

Another increasing use for crating is the growing tendency to crate articles of steel, iron, and other nonferable metals which heretofore were shipped unboxed. This more especially applies to Pennsylvania than any other state because of the number of industries manufacturing steel and iron products. Massive parts of machinery and electrical apparatus, sheet steel, engines and motors, parts of steel bridges, farm machinery, steam and hot water radiators, stoves and ranges, galvanized iron goods, steel frames for street cars, etc., are examples, and crating is intended more to prevent scarring the finish than to protect from breakage.

As Table 48 shows, the Pennsylvania box makers do not demand a few kinds of wood greatly in excess of others. Nor do they use State-grown woods in preference to lumber that comes from other timbered regions. There were 34 kinds of wood and the total of 11 were shipped in from other states. Of
these the principal were several species of southern pine, and the gums that come chiefly from Virginia and the Carolinas. The total quantity is equivalent to 65 per cent. of the total box material used. White pine, chestnut, hemlock, yellow poplar, and beech were in quantity the principal Pennsylvania woods reported, and cherry, sycamore, and butternut the only kinds reported as entirely home grown. Considering the cut of hemlock in the State, the amount used for boxes and crates was disappointing. But in this particular, this report should prove most useful as with the names and addresses of the box makers and of those using lumber for crating the opportunity is given for increasing the home market for the low grades of lumber cut in the State.

Woods are listed in the table that are rarely used for packing boxes. Their appearance can be accounted for by the fact that they are for novelties which are more or less fancy boxes like sewing cases, for toilet articles, utility boxes, shoe polishing outfits, and those more or less ornamental used in stores for keeping cutlery, jewelry, drugs, etc.

### Table 48.—Wood for Packing Boxes and Crates, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft. at factory.</td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>52,719,727</td>
<td>19.25</td>
<td>$32.40</td>
</tr>
<tr>
<td>White pine</td>
<td>51,583,733</td>
<td>18.83</td>
<td>15.00</td>
</tr>
<tr>
<td>Loblolly pine</td>
<td>36,173,129</td>
<td>13.21</td>
<td>17.50</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>15,377,507</td>
<td>5.75</td>
<td>17.40</td>
</tr>
<tr>
<td>Spruce</td>
<td>14,618,576</td>
<td>5.35</td>
<td>17 42</td>
</tr>
<tr>
<td>Red gum</td>
<td>12,806,684</td>
<td>4.68</td>
<td>16.68</td>
</tr>
<tr>
<td>Beech</td>
<td>12,365,839</td>
<td>4.57</td>
<td>16.17</td>
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<tr>
<td>Chestnut</td>
<td>11,977,032</td>
<td>4.37</td>
<td>16.64</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>11,617,000</td>
<td>4.25</td>
<td>16.42</td>
</tr>
<tr>
<td>Hemlock</td>
<td>9,269,635</td>
<td>3.39</td>
<td>16.65</td>
</tr>
<tr>
<td>Red oak</td>
<td>7,224,577</td>
<td>2.64</td>
<td>15.67</td>
</tr>
<tr>
<td>Pitch pine</td>
<td>6,931,500</td>
<td>2.53</td>
<td>16.32</td>
</tr>
<tr>
<td>Birch</td>
<td>5,969,000</td>
<td>2.19</td>
<td>16.76</td>
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<tr>
<td>Cottonwood</td>
<td>4,850,000</td>
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<td>20.40</td>
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<tr>
<td>Cotton gum</td>
<td>2,488,722</td>
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<td>14.13</td>
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<tr>
<td>Black gum</td>
<td>3,669,500</td>
<td>1.32</td>
<td>15.56</td>
</tr>
<tr>
<td>Basswood</td>
<td>2,936,500</td>
<td>1.07</td>
<td>16.83</td>
</tr>
<tr>
<td>Oak</td>
<td>2,726,500</td>
<td>1.02</td>
<td>18.30</td>
</tr>
<tr>
<td>Cypress (bald)</td>
<td>1,719,500</td>
<td>0.62</td>
<td>16.60</td>
</tr>
<tr>
<td>Silver and red maple</td>
<td>1,267,500</td>
<td>0.46</td>
<td>12.35</td>
</tr>
<tr>
<td>Western hemlock</td>
<td>500,000</td>
<td>0.18</td>
<td>20.00</td>
</tr>
<tr>
<td>Western yellow pine</td>
<td>500,000</td>
<td>0.18</td>
<td>20.00</td>
</tr>
<tr>
<td>White oak</td>
<td>500,000</td>
<td>0.14</td>
<td>20.34</td>
</tr>
<tr>
<td>Longleaf pine</td>
<td>241,500</td>
<td>0.60</td>
<td>20.00</td>
</tr>
<tr>
<td>White elm</td>
<td>229,500</td>
<td>0.60</td>
<td>20.50</td>
</tr>
<tr>
<td>Cork elm</td>
<td>200,000</td>
<td>0.67</td>
<td>20.60</td>
</tr>
<tr>
<td>Norway pine</td>
<td>30,000</td>
<td>0.06</td>
<td>20.00</td>
</tr>
<tr>
<td>Yellow buckeye</td>
<td>50,500</td>
<td>0.63</td>
<td>21.86</td>
</tr>
<tr>
<td>Cherry (black)</td>
<td>70,000</td>
<td>0.60</td>
<td>18.60</td>
</tr>
<tr>
<td>Cucumber</td>
<td>70,000</td>
<td>0.60</td>
<td>17.60</td>
</tr>
<tr>
<td>Ash</td>
<td>64,500</td>
<td>0.02</td>
<td>28.51</td>
</tr>
<tr>
<td>Sycamore</td>
<td>11,500</td>
<td>0.02</td>
<td>16.00</td>
</tr>
<tr>
<td>Butternut</td>
<td>5,000</td>
<td>0.02</td>
<td>16.00</td>
</tr>
<tr>
<td>Red cedar</td>
<td>5,000</td>
<td>0.02</td>
<td>16.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>373,904,094</td>
<td>100.00</td>
<td>$18,000</td>
</tr>
</tbody>
</table>

*Less than 1-100 of 1 per cent.*
CAR CONSTRUCTION.

Formerly all rolling stock except locomotive engines were built of wood but in recent years cars made entirely of metal or of wood with steel underframe equipment have begun to be substituted both for freight and passenger cars; and in the increasing extent in which they are meeting the demand each year, it is safe to predict that the amount of wood used in this industry will show a rapid decline. In this connection it is interesting to note that the last session of Congress in the interest of public safety had four bills pending requiring replacement of wooden passenger cars with steel equipment on all railroads. This movement is largely in accord with the present policy of the railroads as recent statistics show that approximately 90 per cent. of the passenger cars ordered for future delivery were specified to be of steel construction.

Notwithstanding the increasing substitution of metal for wood in car building, lumber in large amounts is still in demand. In Pennsylvania 228,000,000 feet or more reported for building or repair of cars for 1911 made that industry as to consumption third in the State. The building of cars of all kinds is represented by Table 49. Electric cars for city and interurban transportation is a division of the industry which requires special mention as more wood is used for passenger vehicle equipment in this line than in any other. Vast amounts of lumber are required each year for building mine cars. The number of mining establishments appearing in the directory appended to this report indicates to what extent work of this kind is done by wood-using departments maintained in connection with mining operations. Only one other state exceeds Pennsylvania in the quantity of wood used for car construction. The order of the principal states and the amount consumed is as follows:

<table>
<thead>
<tr>
<th>State</th>
<th>Amount (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois</td>
<td>407,000,000</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>228,000,000</td>
</tr>
<tr>
<td>New York</td>
<td>77,000,000</td>
</tr>
<tr>
<td>Indiana</td>
<td>59,000,000</td>
</tr>
<tr>
<td>Ohio</td>
<td>56,000,000</td>
</tr>
<tr>
<td>Missouri</td>
<td>51,000,000</td>
</tr>
<tr>
<td>Virginia</td>
<td>51,000,000</td>
</tr>
</tbody>
</table>

Twenty-nine woods were used by the car builders in Pennsylvania and long-leaf pine heads the list, contributing a little over one-third of the total. The superior tensile strength of this wood, its durable properties, and being easy to fit brings it first in demand by the car builder. If all the species of southern yellow pine were combined the amount would represent over one-half the car material reported and taking into consideration the needs of this industry in other states this wood is pre-eminently the principal wood for car construction. Lumber brought from the western states is not used so extensively in Pennsylvania as in other eastern states. Douglas fir and western white pine appear in the table but they were demanded in very limited quantities. The progress made of late in the use of steel underframes for cars of all kinds and especially gondolas and box cars has perhaps affected the use of oak more than any other wood as when these basal parts are made of wood, oak, preferably white and chestnut oak, are the kinds most extensively called for. The great strength of oak and its shock resisting capacity still brings it into wide use for car framing and such purposes, like draft timbers, tie beams, engine beams, platforms, truck parts, etc., and on account of its conspicuous figure, for interior finish of passenger and trolley cars. In this latter capacity it served with ash, birch, yellow poplar, cherry, mahogany, walnut, and red gum. Ash, poplar, and Douglas fir are the woods used in
FURNITURE.

Pennsylvania in the quantity of wood consumed does not compare with a number of other states in the manufacture of furniture, but this industry is one of the oldest in the State and includes in its production the highest grades of furniture and therefore is of considerable economic importance. Furniture can be divided into two general classes: (1) Articles of utility like refrigerators, kitchen cabinets, provision safes, cupboards, etc. These are not a part of the industry here considered, but like chairs have been presented under a separate classification. (2) Commodities where the appearance is as important as durability. In a large number of instances a piece

building the principal parts of locomotive cabs. The floors of the cabs are of sugar maple, the bumpers, pilots, and other parts of the engines are made of white oak.

The annual drain on the forests of the State by the car builders amounts to over 41,000,000 feet. This is less than one-fourth of the total but compared with requirements of other states where the industry is important the quantity of homegrown car material used in Pennsylvania is the largest. Some part of the supply of 20 of the 29 woods were cut in the State. Oak, white pine, hemlock, maple, ash, and beech in the order named as to quantity being the most prominent while the statistics for other woods are as follows:

Table 49.—Wood for Car Construction, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Feet b. m.</th>
<th>Per cent.</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost factory</th>
<th>Feet b. m.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Longleaf pine</td>
<td>76,302,169</td>
<td>33.69</td>
<td>$22.21</td>
<td>$2,477,985</td>
<td>76,302,169</td>
</tr>
<tr>
<td>White oak</td>
<td>59,330,826</td>
<td>24.04</td>
<td>26.63</td>
<td>1,240,166</td>
<td>29,706,332</td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>33,754,324</td>
<td>14.33</td>
<td>26.10</td>
<td>841,105</td>
<td>32,724,255</td>
</tr>
<tr>
<td>Red oak</td>
<td>31,059,190</td>
<td>13.09</td>
<td>20.95</td>
<td>797,322</td>
<td>21,567,217</td>
</tr>
<tr>
<td>White pine</td>
<td>12,826,420</td>
<td>5.62</td>
<td>31.28</td>
<td>402,651</td>
<td>8,767,583</td>
</tr>
<tr>
<td>Loblolly pine</td>
<td>4,877,625</td>
<td>2.11</td>
<td>26.98</td>
<td>125,422</td>
<td>4,827,665</td>
</tr>
<tr>
<td>Ash</td>
<td>4,396,610</td>
<td>0.92</td>
<td>56.70</td>
<td>249,311</td>
<td>3,965,097</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>3,172,113</td>
<td>1.33</td>
<td>57.43</td>
<td>182,175</td>
<td>2,931,050</td>
</tr>
<tr>
<td>Hemlock</td>
<td>3,056,073</td>
<td>0.88</td>
<td>15.03</td>
<td>21,153</td>
<td>1,975,855</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>3,176,110</td>
<td>0.74</td>
<td>43.96</td>
<td>35,856</td>
<td>3,144,650</td>
</tr>
<tr>
<td>Norway pine</td>
<td>1,518,390</td>
<td>0.66</td>
<td>28.97</td>
<td>43,955</td>
<td>1,492,394</td>
</tr>
<tr>
<td>Beech</td>
<td>1,377,000</td>
<td>0.69</td>
<td>17.12</td>
<td>33,583</td>
<td>1,333,000</td>
</tr>
<tr>
<td>Spruce</td>
<td>1,367,605</td>
<td>0.66</td>
<td>24.26</td>
<td>66,932</td>
<td>1,273,790</td>
</tr>
<tr>
<td>Hickory</td>
<td>1,115,308</td>
<td>0.49</td>
<td>24.56</td>
<td>28,135</td>
<td>1,113,950</td>
</tr>
<tr>
<td>Pitch pine</td>
<td>458,800</td>
<td>0.19</td>
<td>16.10</td>
<td>7,033</td>
<td>441,900</td>
</tr>
<tr>
<td>Cherry (black)</td>
<td>421,415</td>
<td>0.19</td>
<td>60.59</td>
<td>26,140</td>
<td>216,951</td>
</tr>
<tr>
<td>Basswood</td>
<td>360,610</td>
<td>0.16</td>
<td>40.74</td>
<td>14,911</td>
<td>228,796</td>
</tr>
<tr>
<td>Cypress (bald)</td>
<td>372,980</td>
<td>0.16</td>
<td>32.52</td>
<td>18,380</td>
<td>373,890</td>
</tr>
<tr>
<td>Birch</td>
<td>315,945</td>
<td>0.14</td>
<td>28.88</td>
<td>9,026</td>
<td>341,946</td>
</tr>
<tr>
<td>Mahogany</td>
<td>230,718</td>
<td>0.10</td>
<td>131.88</td>
<td>30,428</td>
<td>330,718</td>
</tr>
<tr>
<td>Chestnut</td>
<td>113,259</td>
<td>0.05</td>
<td>21.04</td>
<td>2,368</td>
<td>113,259</td>
</tr>
<tr>
<td>Redwood</td>
<td>100,000</td>
<td>0.04</td>
<td>36.99</td>
<td>5,690</td>
<td>100,000</td>
</tr>
<tr>
<td>Western white pine</td>
<td>87,500</td>
<td>0.04</td>
<td>54.99</td>
<td>4,812</td>
<td>87,500</td>
</tr>
<tr>
<td>Douglas fir</td>
<td>70,338</td>
<td>0.03</td>
<td>45.55</td>
<td>3,199</td>
<td>70,338</td>
</tr>
<tr>
<td>Scrub pine</td>
<td>64,905</td>
<td>0.03</td>
<td>23.23</td>
<td>1,509</td>
<td>64,905</td>
</tr>
<tr>
<td>White elm</td>
<td>63,343</td>
<td>0.02</td>
<td>49.42</td>
<td>3,131</td>
<td>63,343</td>
</tr>
<tr>
<td>Black walnut</td>
<td>56,900</td>
<td>0.02</td>
<td>101.13</td>
<td>5,753</td>
<td>56,900</td>
</tr>
<tr>
<td>Red gum</td>
<td>56,140</td>
<td>0.02</td>
<td>27.02</td>
<td>906</td>
<td>56,140</td>
</tr>
<tr>
<td>Black gum</td>
<td>60,000</td>
<td>0.01</td>
<td>58.00</td>
<td>35</td>
<td>60,000</td>
</tr>
<tr>
<td>Total</td>
<td>228,380,900</td>
<td>100.00</td>
<td>$29.53</td>
<td>$6,748,706</td>
<td>41,088,552</td>
</tr>
</tbody>
</table>

*Less than 1/100 of 1 per cent.
of furniture is not only pleasing to the eye in its ornamental appointments but from a practical point of view is made of the most suitable material for the purpose. Wood, on account of its natural, attractive grain will be the regular furniture material as long as hardwood timber lasts, and at present there is almost as wide a choice of material in this line as there is lumber available for more common uses. Of the 35 woods listed in Table 50 some part of 22 are wholly or in part decorative woods. Painted or enameled furniture is again coming into favor and in Pennsylvania a considerable quantity of the softer hardwoods was reported for this line of work.

Among the products included in this industry are bedroom furniture, chiffoniers and bureaus, dining tables and buffets, parlor outfits including upholstered furniture, hall appointments, desks, china closets, and book cases. Many of the woods reported went only into parts of furniture not visible, such as coring, frames, brackets, reinforcements, drawer slides, bottoms, and table slides.

Of the exterior woods for the cheaper grades of furniture, solid woods with pronounced grain are most available like red and white oak, ash, chestnut, red gum, butternut, etc. The more expensive work is usually backed with a fairly strong wood adaptable to glue. stable when in place and finished with veneer. This method produces the most pleasing and attractive effects and a permanence rarely to be achieved by the use of solid woods. Indeed it is a rare occasion when the expensive woods such as mahogany, Circassian walnut, rosewood, bird’s eye maple, black walnut, etc., are used in solid pieces. Veneer is purchased from the veneer mills according to surface measure, the sheets ranging from 1/4 to 3/8 inch in thickness. The foreign woods are imported in the form of logs and flitches and are cut to veneer by mills in this country. Cores or backing for veneer are made of solid and built-up lumber purchased ready-made with several layers of cheap domestic woods glued with grains transversing. This material has the advantage of being freer from warping tendencies than lumber, besides being lighter, having exceptional strength, and not liable to split. A number of the most particular uses of the several woods shown in the table for furniture have been arranged in the following order:

BEDROOM FURNITURE.

Rails.

White oak.
Red oak.
Circassian walnut.
Mahogany.
Sweet birch.
Sugar maple.
Black walnut.
Sycamore.
Yellow poplar.
Cherry.
Red gum.

Panels.

White oak.
Sweet birch.
Black walnut.
Red oak.
Sycamore.
Circassian walnut.
Sugar maple.
Mahogany.
Yellow poplar.
Cherry.
Red gum.

Posts.

Black walnut.
Red oak.
Sycamore.
Mahogany.
Sugar maple.
Sweet birch.
Red gum.
White oak.
Circassian walnut.
Cherry.

Drawer fronts.

White oak.
Sweet birch.
Black walnut.
Sycamore.
Circassian walnut.
Sugar maple.
Red oak.
Mahogany.
Yellow poplar.
Cherry.
Red gum.
BED ROOM FURNITURE—Concluded.

**Drawer sides and ends.**
- Yellow poplar.
- Chestnut.
- Beech.
- Cherry.
- White pine.
- Red gum.
- Sweet birch.
- Basswood.

**Drawer bottoms.**
- Yellow poplar.
- Sycamore.
- Basswood.
- Cotton gum.
- Beech.
- Red gum.
- Cottonwood.

**Drawer slides.**
- Sugar maple.
- Hickory.

**Mirror frames.**
- Sycamore.
- Sugar maple.
- White oak.
- Mahogany.
- Black walnut.
- Circassian walnut.
- Yellow poplar.
- Cherry.
- Red gum.

**Back.**
- Yellow poplar.
- Chestnut.
- White pine.
- Red gum.
- Soft maple.

**Bed slats.**
- Loblolly pine.
- Sweet birch.
- Sugar maple.
- White ash.
- Shortleaf pine.

**UPHOLSTERED FURNITURE.**

**Frames (hidden work).**
- Basswood.
- Soft maple.
- Longleaf pine.
- White oak.
- Chestnut.
- Shortleaf pine.

**Frames (exterior).**
- Mahogany.
- Sweet birch.

**BUFFETS, CHINA CLOSETS, CRYSTAL CABINETS, AND SIDEBOARDS.**

**Tops.**
- Black walnut.
- White oak.
- Red oak.
- Mahogany.
- Sweet birch.

**Rails.**
- White oak.
- Red oak.
- Black walnut.
- Mahogany.
- Sweet birch.

**Backing.**
- Chestnut.
- Basswood.
- Yellow poplar.
- Red gum.
- Soft maple.
- White pine.

**Posts.**
- White oak.
- Red oak.
- Mahogany.

**Shelves.**
- Sweet birch.
- White pine.
- Yellow poplar.
BOOKCASES, DESKS AND MAGAZINE RACKS.

Tops.
- Black walnut.
- White oak.
- Red oak.
- Mahogany.
- Sweet birch.
- Red gum.
- Circassian walnut.
- Yellow poplar.

Doors and drop lids.
- Sweet birch.
- Circassian walnut.
- Mahogany.
- Black walnut.
- White oak.
- Red oak.

Backings.
- Chestnut.
- Basswood.
- Yellow poplar.
- Red gum.
- Soft maple.
- White pine.

Panels.
- Red gum.
- Red oak.
- Mahogany.
- Circassian walnut.
- Sweet birch.
- White oak.
- Black walnut.

Bottoms.
- Basswood.
- White oak.
- Red oak.
- Sugar maple.
- Yellow poplar.

Posts.
- Mahogany.
- Red oak.
- White oak.
- Black walnut.
- Red gum.
- Sweet birch.
- Circassian walnut.

Shelves.
- Sweet birch.
- White pine.
- Basswood.
- Yellow poplar.

LIBRARY AND DINING ROOM TABLES.

Tops.
- White oak.
- Chestnut.
- Sweet birch.
- Red gum.
- Butternut.

Slides.
- Sugar maple.
- Beech.

Legs.
- White oak.
- Sweet birch.
- Red gum.
- Mexican mahogany.
- Sugar maple.

Table leaves.
- White oak.
- Red oak.
- Mahogany.
- Sweet birch.
- Butternut.

Pedestals.
- White oak.
- Red oak.
- Mahogany.
- Sweet birch.
- Yellow poplar.

 Rails.
- White oak.
- Red oak.
- Mahogany.
- Sweet birch.
- Red gum.
- Butternut.
### Table 50.—Wood for Furniture, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Grown in Pennsyl-</th>
<th>Grown Out of Pennsyl-</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>at factory.</td>
<td>Total cost f. o. b. factory.</td>
</tr>
<tr>
<td>Red oak</td>
<td>16,691,700</td>
<td>27.28</td>
<td>$35.73</td>
<td>$574,997</td>
</tr>
<tr>
<td>Chestnut</td>
<td>11,555,800</td>
<td>19.59</td>
<td>$25.59</td>
<td>289,335</td>
</tr>
<tr>
<td>White oak</td>
<td>10,133,000</td>
<td>17.14</td>
<td>$31.90</td>
<td>379,232</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>4,743,000</td>
<td>8.04</td>
<td>$26.72</td>
<td>126,632</td>
</tr>
<tr>
<td>Basswood</td>
<td>3,945,400</td>
<td>6.97</td>
<td>$35.12</td>
<td>136,002</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>2,892,000</td>
<td>4.80</td>
<td>$36.86</td>
<td>106,502</td>
</tr>
<tr>
<td>Red gum</td>
<td>2,347,000</td>
<td>3.99</td>
<td>$31.25</td>
<td>73,666</td>
</tr>
<tr>
<td>Red and silver maple</td>
<td>1,478,500</td>
<td>2.51</td>
<td>$25.49</td>
<td>37,652</td>
</tr>
<tr>
<td>Beech</td>
<td>1,463,000</td>
<td>2.46</td>
<td>$19.33</td>
<td>26,982</td>
</tr>
<tr>
<td>Mahogany</td>
<td>1,145,500</td>
<td>1.94</td>
<td>$116.42</td>
<td>133,775</td>
</tr>
<tr>
<td>Birch</td>
<td>1,135,270</td>
<td>1.93</td>
<td>$29.10</td>
<td>33,126</td>
</tr>
<tr>
<td>Cottonwood</td>
<td>230,000</td>
<td>.40</td>
<td>$34.87</td>
<td>13,250</td>
</tr>
<tr>
<td>White pine</td>
<td>200,700</td>
<td>.34</td>
<td>$44.12</td>
<td>13,233</td>
</tr>
<tr>
<td>Cotton gum</td>
<td>220,000</td>
<td>.40</td>
<td>$33.54</td>
<td>7,333</td>
</tr>
<tr>
<td>Red cedar</td>
<td>175,100</td>
<td>.39</td>
<td>$99.81</td>
<td>10,330</td>
</tr>
<tr>
<td>Ash</td>
<td>175,500</td>
<td>.39</td>
<td>$25.83</td>
<td>4,869</td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>147,000</td>
<td>.21</td>
<td>$32.92</td>
<td>3,724</td>
</tr>
<tr>
<td>Longleaf pine</td>
<td>125,500</td>
<td>.23</td>
<td>$31.83</td>
<td>4,048</td>
</tr>
<tr>
<td>Black walnut</td>
<td>130,100</td>
<td>.22</td>
<td>$95.64</td>
<td>12,385</td>
</tr>
<tr>
<td>Cherry (black)</td>
<td>112,500</td>
<td>.19</td>
<td>$34.74</td>
<td>3,857</td>
</tr>
<tr>
<td>Circassian walnut</td>
<td>92,810</td>
<td>.16</td>
<td>$36.85</td>
<td>23,801</td>
</tr>
<tr>
<td>Cypress (bald)</td>
<td>84,500</td>
<td>.14</td>
<td>$42.19</td>
<td>3,747</td>
</tr>
<tr>
<td>Sycamore</td>
<td>66,170</td>
<td>.11</td>
<td>$43.89</td>
<td>2,904</td>
</tr>
<tr>
<td>Lobolly pine</td>
<td>50,000</td>
<td>.10</td>
<td>$23.79</td>
<td>1,352</td>
</tr>
<tr>
<td>Western yellow pine</td>
<td>10,000</td>
<td>.02</td>
<td>$45.00</td>
<td>450</td>
</tr>
<tr>
<td>Rosewood</td>
<td>5,150</td>
<td>.01</td>
<td>$590.00</td>
<td>2,550</td>
</tr>
<tr>
<td>Eucalyptus</td>
<td>5,000</td>
<td>.01</td>
<td>$790.00</td>
<td>1,397</td>
</tr>
<tr>
<td>Butternut</td>
<td>3,500</td>
<td>.01</td>
<td>$26.61</td>
<td>92</td>
</tr>
<tr>
<td>Spanish cedar</td>
<td>2,500</td>
<td>.01</td>
<td>$90.00</td>
<td>200</td>
</tr>
<tr>
<td>Southern white cedar</td>
<td>1,250</td>
<td>1.30</td>
<td>$130.00</td>
<td>156</td>
</tr>
<tr>
<td>Mountain laurel</td>
<td>1,000</td>
<td>1.00</td>
<td>$40.00</td>
<td>40</td>
</tr>
<tr>
<td>Hickory</td>
<td>750</td>
<td>.01</td>
<td>$33.33</td>
<td>11</td>
</tr>
<tr>
<td>Sumach</td>
<td>500</td>
<td>.01</td>
<td>$90.00</td>
<td>40</td>
</tr>
<tr>
<td>Teak</td>
<td>190</td>
<td>.01</td>
<td>$200.00</td>
<td>38</td>
</tr>
<tr>
<td>Slatwood</td>
<td>120</td>
<td>.01</td>
<td>$200.00</td>
<td>40</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>56,935,170</td>
<td>100.00</td>
<td>$35.24</td>
<td>$2,678,917</td>
</tr>
</tbody>
</table>

*Less than 1/100 of 1 per cent.

### CHAIRS.

Pennsylvania is one of the three leading states in the manufacture of chairs. Over 30,000,000 feet of wood is annually required for their manufacture and of this amount considerably over half is furnished by the forests of the State. The order of the first six states in quantity of wood consumed for chairs is as follows: Wisconsin, North Carolina, Pennsylvania, Massachusetts, New York, and Vermont. It may occur to some that chairs should be grouped with furniture but in Pennsylvania as in other states their manufacture is essentially a distinct industry, generally the form of the raw material is different, the processes of manufacture are in nowise similar, and the products are marketed separately.

Dimension stock is the form of raw material that is utilized in the chair industry perhaps to a greater extent than any other. Sawmills cutting hardwoods and factories using them, principally beech, birch, and maple, often operate as a side line the bolting of low grades and waste into these squares.
Many go as far as to turn the dimensions on lathes after bolting and sell them in that form to chair factories ready to assemble. In the case of the lumbermen, frequently small crooked logs, tops, wind shakes, cut offs, which can be worked for sale in no other way, are thus disposed of. The chair makers, therefore, play an important part not only in lending to the industrial development of the State but also to the movement of conservation in their efforts to encourage utilization or waste. One manufacturer purchases hardwood slabs and edgings from a nearby sawmill and transports this material to his factory for turning handles and chair stock. Another purchases part of the refuse of hardwood stave manufacturers, selects the core and other large pieces, and converts them into chair dowels and rungs.

Chair dimensions include stock of various sizes and kinds for the large number of different designs the chair manufacturers turn out. Table 51 shows the number and kinds of woods that were used in Pennsylvania. Not all chair material is in dimensions by any means. Because seats and backs are altogether cut out of plank ranging from 1 1/2 inches to 2 1/2 inches thick and because the factories are not able to secure enough dimension and turned material to meet their requirements, they are compelled to buy large quantities of plank and rip them up into squares for posts, pillars, spindles, rounds, dowels, etc. The chair stock is always seasoned before used, but those producing squares and turned stock often use unseasoned wood allowing it to air-dry under cover after being manufactured. To prevent loss caution is taken to make allowance for shrinkage and the producer is particular to see to it that the chair stock is straight grained, practically free from defects, and accurately manufactured to conform to specifications.

Perhaps the largest part of the wood used in Pennsylvania is required for turned chairs but quantities are also demanded for straight line designs where the parts are cut considerably wider than they are thick. The demand for these in late years has been on the increase and has led up to the mission patterns in which the stock is still wider and heavier.

Unlike the parts of turned chairs, the manufacturers do not buy their material for the square designs to any extent in the form of dimensions but usually cut them from plank. This is unfortunate because the sawmills have a considerable amount of waste which it is practical to cut into dimension stuff suitable for this line of manufacture. Millmen should note this opportunity and consider negotiations for furnishing this material from waste; and, on the other hand, the economy to the manufacturers should induce the latter to consider the advisability of making overtures to the millmen. Oak, both red and white, ash, and chestnut are the principal woods for chairs of square and mission designs. Other woods like red gum, birch, and elm are used and a figure is stamped on them resembling oak, mahogany, and other woods. That the better grades of chairs are made in Pennsylvania as well as cheaper ones, is evident by the quantity of mahogany brought into the State each year to meet the demand. Birch is most used for imitating mahogany. Woods used for various parts of chairs are as follows:

**CHAIRS.**

**Arms.**

<table>
<thead>
<tr>
<th>Mahogany.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red gum.</td>
</tr>
<tr>
<td>Soft maple.</td>
</tr>
<tr>
<td>White oak.</td>
</tr>
</tbody>
</table>

**Blank.**

<table>
<thead>
<tr>
<th>Birch.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elm.</td>
</tr>
<tr>
<td>Mahogany.</td>
</tr>
</tbody>
</table>

**Bent arms.**

<table>
<thead>
<tr>
<th>Elm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahogany.</td>
</tr>
<tr>
<td>Red gum.</td>
</tr>
<tr>
<td>Red oak.</td>
</tr>
<tr>
<td>Soft maple.</td>
</tr>
<tr>
<td>White oak.</td>
</tr>
<tr>
<td>Yellow poplar.</td>
</tr>
</tbody>
</table>
Camp chairs and stools.
  Beech.
  Birch.
  Sugar maple.

Chair frames, upholstered.
  Chestnut.
  Red oak.
  Soft maple
  Sugar maple.
  White oak.

Dowels.
  Beech.
  Birch.
  Soft maple.
  Sugar maple.

Fancy chairs.
  Mahogany.
  Sycamore.
  Walnut, black.

Pillars.
  Beech.
  Birch.
  Sugar maple.
  White oak.

Posts.
  Beech.
  Birch.
  Mahogany.
  Sugar maple.
  Red oak.
  White ash.
  White oak.

Rockers.
  Elm.
  Sugar maple.
  White ash.
  White oak.

Rolling chair parts.
  Hickory.
  Red oak.
  Sugar maple.
  White oak.

Rounds.
  Beech.
  Birch.
  Hickory.
  White oak.
  White ash.

Seat frames.
  Red oak.

Seats.
  Elm.
  Mahogany.
  Red gum.
  Red oak.
  Soft maple.
  White oak.
  Yellow poplar.

Split seats.
  Hickory.

Split backs.
  Hickory.

Legs.
  Beech.
  Birch.
  Mahogany.
  Sugar maple.
  Red oak.
  White oak.

Mission chairs.
  Red oak.
  White oak.

Panels.
  Mahogany.

Piano stools and benches.
  Birch.
  Mahogany.
  Sugar maple.
  White oak.

Spindles.
  Beech.
  Birch.
  Sugar maple.
  White ash.

Stretchers.
  Beech.
  Birch.
  Sugar maple.
  White ash.

Built-up chair stock, veneer.
  Basswood.
  Birch.
  Chestnut.
  Mahogany.
  Red gum.
  Red oak.
  Soft maple.
  Sugar maple.
  Walnut, Circassian.
  White ash.
  White oak.
Table 51.—Wood for Chairs, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>at factory.</td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Beech</td>
<td>8,420,000</td>
<td>25.42</td>
<td>$17.21</td>
<td>144,945</td>
<td>7,295,000</td>
</tr>
<tr>
<td>White elm</td>
<td>6,213,500</td>
<td>18.76</td>
<td>16.66</td>
<td>106,243</td>
<td>62,600</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>5,348,100</td>
<td>16.15</td>
<td>18.54</td>
<td>99,159</td>
<td>4,746,500</td>
</tr>
<tr>
<td>Red gum</td>
<td>4,826,000</td>
<td>13.06</td>
<td>25.97</td>
<td>112,338</td>
<td>4,326,000</td>
</tr>
<tr>
<td>Red oak</td>
<td>2,997,500</td>
<td>9.05</td>
<td>33.90</td>
<td>101,755</td>
<td>1,066,500</td>
</tr>
<tr>
<td>White oak</td>
<td>2,238,500</td>
<td>6.73</td>
<td>42.10</td>
<td>93,387</td>
<td>231,500</td>
</tr>
<tr>
<td>Birch</td>
<td>952,400</td>
<td>3.00</td>
<td>30.05</td>
<td>29,823</td>
<td>553,500</td>
</tr>
<tr>
<td>Red and silver maple</td>
<td>915,500</td>
<td>2.77</td>
<td>28.17</td>
<td>25,576</td>
<td>155,000</td>
</tr>
<tr>
<td>Sycamore</td>
<td>500,000</td>
<td>1.51</td>
<td>25.00</td>
<td>12,500</td>
<td>500,000</td>
</tr>
<tr>
<td>Chestnut</td>
<td>400,000</td>
<td>1.45</td>
<td>17.71</td>
<td>6,499</td>
<td>35,000</td>
</tr>
<tr>
<td>Mahogany</td>
<td>461,500</td>
<td>1.39</td>
<td>119.11</td>
<td>50,848</td>
<td>461,800</td>
</tr>
<tr>
<td>Ash</td>
<td>104,000</td>
<td>0.32</td>
<td>24.54</td>
<td>2,559</td>
<td>87,300</td>
</tr>
<tr>
<td>Black walnut</td>
<td>50,000</td>
<td>0.15</td>
<td>60.03</td>
<td>3,204</td>
<td>41,000</td>
</tr>
<tr>
<td>Basswood</td>
<td>33,000</td>
<td>0.11</td>
<td>69.22</td>
<td>739</td>
<td>25,000</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>24,000</td>
<td>0.07</td>
<td>33.05</td>
<td>936</td>
<td>24,600</td>
</tr>
<tr>
<td>Hickory</td>
<td>15,000</td>
<td>0.05</td>
<td>17.20</td>
<td>233</td>
<td>75,000</td>
</tr>
<tr>
<td>Circassian walnut</td>
<td>3,500</td>
<td>0.01</td>
<td>200.00</td>
<td>760</td>
<td>3,360</td>
</tr>
<tr>
<td>Total</td>
<td>32,117,000</td>
<td>100.00</td>
<td>$23.80</td>
<td>$854,412</td>
<td>14,406,600</td>
</tr>
</tbody>
</table>

VEHICLES AND VEHICLE PARTS.

The statistics presented in Table 52 represent the wood used both for motor and horse drawn vehicles. Though there is considerable material used in the manufacture of motor cars including both pleasure cars and commercial trucks, fully 90 per cent. of the material reported went into the latter. The rapid growth of the automobile industry has greatly increased the demand for the vehicle woods, but, according to reports, has not made a corresponding reduction in the demand for horse drawn vehicles. In fact a number of Pennsylvania manufacturers, especially wagon makers, remarked upon the increased production of horse drawn vehicles in the last five years; and those that formerly specialized in building buggies and wagons and now are engaged in making autos have in most cases not relinquished the manufacture of the horse vehicle but have increased their facilities and manufacture both kinds.

Often carriage manufacturers are practically nothing more than assemblers of parts. They buy the wheels and other portions of the running gears and the bodies and tops already manufactured and enter into production only as finishers. In the same way wheelwrights and repair shops that are distributed in nearly every village and town throughout Pennsylvania purchase much of their material like spokes, rims, hubs, bounds, and felloes ready to use. Information was not solicited from these classes of establishments as the scope of the investigation excludes them.

The number of manufacturers making vehicle parts is large in Pennsylvania and the quantity of wood they consumed represents the largest proportion of that shown in the table. Most of this class report making only one commodity as hubs, spokes, rims, poles or shafts. A few, however, specialize in manufacturing two, but in no instance were there reported as many as three.
Fig. 5.—Utilization of mill waste. Rough squares are bolted from slabs and edgings, and turned into chair stock.

Fig. 6.—Chair parts and the squares or dimension stock from which they are made.
Fig. 7. Parts of a farm wagon, and the woods used.
DESCRIPTION OF FIGURE 7.

FARM WAGON.

Fig. 1. Wagon Body.
2. Sills: White Oak, Red Oak, Sugar Maple, White Ash.

Fig. 2. Rear Gear.
1. Stakes.
2. Bolsters.
3. Axle bed or axle cap.
4. Brake block.
5. Rear hounds.
6. Hub bar.
7. Brake bar.

Fig. 3. Front Gear.
1. Yoke.
2. Hound bar.
4. Axle.
5. Front hounds.

Fig. 4. Seat.
1. Back board.
2. Side boards.

Fig. 5.
1. Reach: White Oak, Red Oak, White Ash, Hickory.
3. Drop tongue.

Fig. 6.
1. Singletree.
2. Doubletree.

Fig. 7. Axle and Hub.
1. Skein.
2. Spoke.
3. Hub.
5. Axle.

Fig. 8. Wheel.
2. Felloe or rim: White Oak, Red Oak, White Ash.
**Fig. 8.** Showing parts of delivery wagon, and woods used.

**PLATFORM DELIVERY WAGON.**

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Woods Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Top strips or slats:</td>
<td>White Ash, Basswood, White Pine, Yellow Poplar, Sweet Birch</td>
</tr>
<tr>
<td>2</td>
<td>Top rail:</td>
<td>White Ash, White Oak</td>
</tr>
<tr>
<td>3</td>
<td>Upper panel:</td>
<td>Yellow Poplar</td>
</tr>
<tr>
<td>4</td>
<td>Belt or belt panel:</td>
<td>White Ash, White Oak</td>
</tr>
<tr>
<td>5</td>
<td>Drop gate:</td>
<td>White Ash, White Oak, Red Oak</td>
</tr>
<tr>
<td>6</td>
<td>Lower panel or lower side board:</td>
<td>White Oak, White Ash</td>
</tr>
<tr>
<td>7</td>
<td>Stay bar or rear end crossbar:</td>
<td>White Oak, Red Oak, White Ash</td>
</tr>
<tr>
<td>8</td>
<td>Hind spring bar or rear spring crossbar:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>9</td>
<td>Felloe or rim:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>10</td>
<td>Spoke:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>11</td>
<td>Shackle bar or front spring crossbar:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>12</td>
<td>Fifth wheel circles:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>13</td>
<td>Spring yoke or spring head block:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>14</td>
<td>Hub:</td>
<td>Black Gum, Rock Elm, Black Locust</td>
</tr>
<tr>
<td>15</td>
<td>Lower head block:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>16</td>
<td>Side futchel:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>17</td>
<td>Fifth wheel spools:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>18</td>
<td>Singletree:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>19</td>
<td>Hounds or pole futchels:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>20</td>
<td>Splinter or drawbar:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>21</td>
<td>Upper head block or fifth wheel futchel:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>22</td>
<td>Fifth wheel bars or transom bars:</td>
<td>Hickory, White Ash</td>
</tr>
<tr>
<td>23</td>
<td>Footboard or heel board:</td>
<td>White Oak, White Ash</td>
</tr>
<tr>
<td>24</td>
<td>Wagon bed:</td>
<td>White Pine, Longleaf Pine, White Ash, Yellow Poplar, White Oak</td>
</tr>
<tr>
<td>25</td>
<td>Front panel or cross board:</td>
<td>Yellow Poplar, White Ash, White Oak</td>
</tr>
<tr>
<td>26</td>
<td>Seat board:</td>
<td>White Pine, Longleaf Pine, White Oak, Red Oak</td>
</tr>
<tr>
<td>27</td>
<td>SIB:</td>
<td>White Oak, White Ash</td>
</tr>
<tr>
<td>28</td>
<td>Lining:</td>
<td>Yellow Poplar, White Pine, Longleaf Pine, Red Oak</td>
</tr>
<tr>
<td>29</td>
<td>Corner posts or pillars:</td>
<td>White Oak, White Ash</td>
</tr>
<tr>
<td>30</td>
<td>Side pillars:</td>
<td>White Oak, White Ash</td>
</tr>
<tr>
<td>31</td>
<td>Side slats or rails:</td>
<td>White Oak, White Ash</td>
</tr>
<tr>
<td>32</td>
<td>Rear end posts:</td>
<td>White Oak, White Ash</td>
</tr>
</tbody>
</table>
Fig. 9.—Body of an old-time Conestoga wagon. This style of wagon is still being manufactured in Pennsylvania.

Fig. 10.—Hickory, oak and pine waste of a large Pennsylvania wagon manufacturer being sold for fuel. Much of this is suitable for small commodities made from this wood.
Thirty-two kinds of wood are used by the vehicle industry. That so many kinds are required is surprising, but this can probably be accounted for by the search being made for substitutes which has brought species heretofore little used into this industry for experimentation. For instance, elm was formerly the chief hub wood, but now birch has proved practical and large quantities are consumed by the hub makers. Yellow locust and black gum are also extensively used. Hickory was the principal spoke wood but now vast amounts of white and red oak are demanded; while yellow poplar does better than any other wood for bodies, large quantities of cottonwood and red gum are taking its place and some manufacturers prefer these because they do not split so easily and are susceptible of taking a higher polish. White ash is chiefly used at the present time for vehicle bows but it is not so well adapted to this use as hickory, white oak, or cork elm.

Hickory is the premier wood in vehicle making and white oak the next. The use of both of these is confined mainly to the production of gear parts. In the manufacture of heavy wagons, which is one of the most important divisions of this industry in Pennsylvania, white oak and red oak, the latter to a much less extent, are in the greatest demand. Yellow poplar, which comes third in the list, indicates the high grades of vehicle made in the State, as only the high priced carriages, delivery wagons, and automobiles can afford this wood on account of its cost. In the manufacture of automobile bodies and to a small extent for horse drawn vehicles metal has proved a formidable competitor of wood, but the fact that it is used for cheaper grades indicates that the use of wood gives better results. Next to yellow poplar, ash entered into body construction more than any other wood and in some states in which studies similar to this have been made the quantity used in this line exceeds that of yellow poplar. In Pennsylvania ash stands fourth. All of the rich cabinet woods reported were employed by the automobile body makers.

Table 52.—Wood for Vehicles and Vehicle Parts, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Hickory</td>
<td>10,819,553</td>
<td>30.02</td>
<td>$48.51</td>
</tr>
<tr>
<td>White oak</td>
<td>10,819,553</td>
<td>30.02</td>
<td>$48.51</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>3,044,322</td>
<td>10.64</td>
<td>$56.39</td>
</tr>
<tr>
<td>Ash</td>
<td>2,389,472</td>
<td>11.29</td>
<td>$44.16</td>
</tr>
<tr>
<td>Beech</td>
<td>1,544,200</td>
<td>9.76</td>
<td>$28.43</td>
</tr>
<tr>
<td>Red oak</td>
<td>954,900</td>
<td>5.73</td>
<td>$28.43</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>825,800</td>
<td>4.67</td>
<td>$28.67</td>
</tr>
<tr>
<td>Beech</td>
<td>537,883</td>
<td>3.18</td>
<td>$28.97</td>
</tr>
<tr>
<td>Black pine</td>
<td>477,850</td>
<td>2.80</td>
<td>$28.97</td>
</tr>
<tr>
<td>Basswood</td>
<td>477,850</td>
<td>2.80</td>
<td>$28.97</td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>477,850</td>
<td>2.80</td>
<td>$28.97</td>
</tr>
<tr>
<td>Cork elm</td>
<td>477,850</td>
<td>2.80</td>
<td>$28.97</td>
</tr>
<tr>
<td>Red gum</td>
<td>477,850</td>
<td>2.80</td>
<td>$28.97</td>
</tr>
<tr>
<td>Black gum</td>
<td>191,999</td>
<td>1.17</td>
<td>$28.97</td>
</tr>
<tr>
<td>White pine</td>
<td>140,550</td>
<td>0.84</td>
<td>$28.97</td>
</tr>
<tr>
<td>Kind of Wood</td>
<td>Quantity</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>--------------</td>
<td>----------</td>
<td>-----------</td>
<td>--------------------------</td>
</tr>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hornbeam,</td>
<td>100,000</td>
<td>.32</td>
<td>30.00</td>
</tr>
<tr>
<td>White elm,</td>
<td>39,500</td>
<td>.28</td>
<td>24.31</td>
</tr>
<tr>
<td>Cottonwood,</td>
<td>64,000</td>
<td>.20</td>
<td>24.38</td>
</tr>
<tr>
<td>Pitch pine,</td>
<td>65,200</td>
<td>.17</td>
<td>22.77</td>
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<tr>
<td>Silver maple</td>
<td>47,000</td>
<td>.15</td>
<td>22.13</td>
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<tr>
<td>Loblolly pine</td>
<td>41,000</td>
<td>.13</td>
<td>20.05</td>
</tr>
<tr>
<td>Chestnut,</td>
<td>30,200</td>
<td>.10</td>
<td>19.77</td>
</tr>
<tr>
<td>Mahogany,</td>
<td>14,900</td>
<td>.06</td>
<td>15.93</td>
</tr>
<tr>
<td>Locust (black),</td>
<td>11,000</td>
<td>.04</td>
<td>18.73</td>
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<tr>
<td>Spence,</td>
<td>4,000</td>
<td>.02</td>
<td>48.88</td>
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<tr>
<td>Cucumber,</td>
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<td>.01</td>
<td>25.09</td>
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<tr>
<td>Cherry (black),</td>
<td>2,256</td>
<td>.01</td>
<td>21.66</td>
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<tr>
<td>Walnut (black),</td>
<td>1,400</td>
<td>.01</td>
<td>21.42</td>
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<tr>
<td>Cypress (bald),</td>
<td>1,000</td>
<td>.01</td>
<td>30.09</td>
</tr>
<tr>
<td>Walnut (Circassian),</td>
<td>560</td>
<td>.02</td>
<td>35.09</td>
</tr>
<tr>
<td>Rosewood,</td>
<td>100</td>
<td>.00</td>
<td>36.09</td>
</tr>
<tr>
<td>Total,</td>
<td>31,501,569</td>
<td>100.00</td>
<td>$43.63</td>
</tr>
</tbody>
</table>

**SHIPS AND BOATS.**

The Delaware River's close and direct connection with the Atlantic Ocean as far up as Philadelphia affords sufficient depth and natural advantages to make that city one of the principal harvestors of the Atlantic coast. All kinds of seafaring vessels land at its ports, including men-of-war and ocean liners, and railroads have located their terminal docks along its banks on the Pennsylvania side providing conveniences for the loading of coal, grain, and other commodities for export. In the western part of the State the Ohio River and its navigable tributaries afford excellent advantages for river navigation and accordingly the transportation of coal, sand, ore, lumber, steel, and other heavy freight for short hauls has become an important industry. Flat bottom boats are the kind used, such as packets, river tugs, barges, scows, flats, etc. A number of rivers in Pennsylvania, navigable only for small crafts, traverse parts widely known for their picturesque scenery. These are rarely used in commerce, but are inviting to the pleasure seekers for sailing, rowing, and canoeing. It is evident that in order to meet the local demand, the industry of ship and boat building in Pennsylvania must necessarily be varied. Crafts of all kinds are built in the State, from dreadnaughts and ocean steamers down to the shell used by the professional oarsmen.

In building large vessels, steel construction has, to a large extent taken the place of wood. Probably in no other industry has substitution been carried so far as in shipbuilding. It has been less than a century when wood for this kind of boat was the most important and valuable material used, and though still required, its use is only incidental and answers principally for decking, interior finish, furniture, masts, spars and booms, armor backing, templates, joinery work, etc. Smaller boats like steamers for inland water transportation, ferry boats, tugs, etc., use wood more extensively. Their hulls are of metal but their superstructure is mainly of wood while river crafts,
scows, and barges are entirely of wood, and the same is true of small sail boats, canoes, launches, and other pleasure craft.

This industry not only supplies a large part of the local demand but boats built in Pennsylvania are sold world wide. Other states have more extensive harbor facilities, water fronts, and inland waterways than Pennsylvania, but are not comparable in the size and importance of their shipbuilding industry. In fact only one state surpasses Pennsylvania in the quantity of lumber consumed for boat building. New York in 1912 used 37,700,500 feet while other states in order for quantity are as follows:

Pennsylvania, .......... 27,635,000
New Jersey, ............ 13,341,000
Virginia, ............... 11,138,000
Delaware, .............. 7,679,000
Connecticut, .......... 7,084,354

The uses of wood in boat building are multitudinous. In an ordinary schooner made of wood there are 500 different parts separately named. A large number of them require lumber with special qualities, which probably accounts for the long list of woods shown in Table 53. It is impossible to undertake to specify here the different woods for all parts of the many kinds of boats produced in the State but a few of the principal uses of lumber were mentioned by the boat builders and from their reports the following list has been arranged:

**SHIPS, YACHTS, AND RIVER CRAFT.**

**Frames.**
- White oak.
- Red oak.
- Hemlock.

**Keels.**
- White pine.
- White oak.
- Cypress.
- Hemlock.
- Red oak.

**Knees.**
- White oak.
- White ash.
- Sassafras.
- Tamarack.

**Paddle Wheels.**
- White oak.
- Yellow poplar.

**Stern Posts.**
- White oak.
- Tamarack.

**Rudders.**
- White oak.
- White pine.
- Cypress.

**Planking.**
- Cypress.
- White pine.
- Shortleaf pine.
- Douglas fir.
- Spruce.

**Decking.**
- Cypress.
- White pine.
- Hemlock.
- Douglas fir.

**Rails.**
- Teakwood.
- Mahogany.
- White ash.
- White oak.
- Longleaf pine.
- Hickory.

**Masts.**
- Spruce.
- Hemlock.
- Douglas fir.

**Booms.**
- Spruce.
- Hemlock.
- Douglas fir.
- Shortleaf pine.
- Longleaf pine.

**Cabins (Interior).**
- Chestnut.
- Mahogany.
- Teakwood.
- White ash.
- Sweet birch.
- Sycamore.
- Cypress.
- *Black walnut.
- *Circassian walnut.
- Butternut.
SHIPS, YACHTS, AND RIVER CRAFT—Concluded.

**Cabins (Exterior).**
- White pine.
- Yellow poplar.
- Hemlock.
- Douglas fir.
- Cypress.
- Longleaf pine.

**Frames.**
- White oak.
- Red oak.
- Hemlock.

**Decking.**
- Longleaf pine.
- Hemlock.

**Stern Posts.**
- White oak.

**Keels.**
- White pine.
- White oak.
- Cypress.
- Douglas fir.
- Red oak.

**Knees.**
- White oak.
- White ash.
- Red oak.

**Planking.**
- Hemlock.
- Longleaf pine.
- Douglas fir.

**Barges, Scows, and Flats.**
- Douglas fir.
- Red oak.

**Planking.**
- White pine.
- Spruce.
- Douglas fir.
- Red oak.

**Stern Posts.**
- White oak.
- White ash.

**Motors.**
- White oak.
- White ash.

**Deck Beams.**
- White oak.
- Red oak.

**Ribs.**
- White oak.
- Red oak.
- White ash.

**Coaming.**
- White ash.
- White oak.

**Planking.**
- Cypress.
- White cedar.

*Not reported.*
### CANOES AND SKIFFS.

<table>
<thead>
<tr>
<th>Gunwales</th>
<th>Ribs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spruce</td>
<td>White cedar.</td>
</tr>
<tr>
<td>Mahogany</td>
<td>Spanish cedar.</td>
</tr>
<tr>
<td></td>
<td>White ash.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Paddles</th>
<th>Decks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spruce</td>
<td>White ash.</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>Sweet birch.</td>
</tr>
<tr>
<td></td>
<td>Sugar maple.</td>
</tr>
<tr>
<td></td>
<td>Mahogany.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Planking</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>White cedar</td>
<td></td>
</tr>
<tr>
<td>Spruce</td>
<td></td>
</tr>
<tr>
<td>Spanish cedar</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bottom Boards</th>
<th>Stern Posts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortleaf pine</td>
<td>White oak.</td>
</tr>
<tr>
<td>Spruce</td>
<td>Longleaf pine.</td>
</tr>
<tr>
<td>White pine.</td>
<td></td>
</tr>
<tr>
<td>Cypress</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sides</th>
<th>Transoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>White pine.</td>
<td>Shortleaf pine.</td>
</tr>
<tr>
<td>Douglas fir.</td>
<td>Spruce.</td>
</tr>
<tr>
<td>Hemlock.</td>
<td>Hemlock.</td>
</tr>
<tr>
<td>Spruce.</td>
<td>White pine.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oars</th>
<th>Seats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spruce.</td>
<td>White pine.</td>
</tr>
<tr>
<td>White ash.</td>
<td>Longleaf pine.</td>
</tr>
<tr>
<td></td>
<td>Shortleaf pine.</td>
</tr>
<tr>
<td></td>
<td>Hemlock.</td>
</tr>
</tbody>
</table>

Longleaf pine is the principal species for shipbuilding. It is listed ahead of all other woods, not only in Pennsylvania but in all the important boat building states. Douglas fir is brought from the Pacific coast states especially for parts, as is seen above, requiring timbers of large dimensions and long lengths. It is easily worked, holds its shape, and, similar to longleaf pine, possesses great tensile strength and elasticity. The Pennsylvania ship builders demand more of this wood than is shown by the same industry in any other state. The same is true of hemlock and this is quite significant in that it serves principally for bottoms, planking, and other parts of river crafts for which white pine heretofore has been most extensively used. White pine still meets a portion of the ship builders' demands, irrespective of its growing price. Of the total amount used, 65 per cent. was reported as home grown. Mahogany, teak and Spanish cedar were the only foreign woods reported.

---

### ROW BOATS.

<table>
<thead>
<tr>
<th>Bottom Boards</th>
<th>Stern Posts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortleaf pine</td>
<td>White oak.</td>
</tr>
<tr>
<td>Spruce</td>
<td>Longleaf pine.</td>
</tr>
<tr>
<td>White pine.</td>
<td></td>
</tr>
<tr>
<td>Cypress</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sides</th>
<th>Transoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>White pine.</td>
<td>Shortleaf pine.</td>
</tr>
<tr>
<td>Douglas fir.</td>
<td>Spruce.</td>
</tr>
<tr>
<td>Hemlock.</td>
<td>Hemlock.</td>
</tr>
<tr>
<td>Spruce.</td>
<td>White pine.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oars</th>
<th>Seats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spruce.</td>
<td>White pine.</td>
</tr>
<tr>
<td>White ash.</td>
<td>Longleaf pine.</td>
</tr>
<tr>
<td></td>
<td>Shortleaf pine.</td>
</tr>
<tr>
<td></td>
<td>Hemlock.</td>
</tr>
</tbody>
</table>
Table 53.—Wood for Ship and Boat Building, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td>$/1,000 ft.</td>
<td>$/1,000 ft.</td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Longleaf pine</td>
<td>5,286,000</td>
<td>19.70</td>
<td>37.56</td>
<td>188,520</td>
<td>2,230,000</td>
<td>1,989,000</td>
</tr>
<tr>
<td>White pine</td>
<td>4,541,650</td>
<td>17.41</td>
<td>36.53</td>
<td>212,268</td>
<td>2,782,000</td>
<td>1,811,000</td>
</tr>
<tr>
<td>Hemlock</td>
<td>3,833,000</td>
<td>16.28</td>
<td>35.92</td>
<td>221,251</td>
<td>2,417,000</td>
<td>1,206,000</td>
</tr>
<tr>
<td>White oak</td>
<td>3,871,409</td>
<td>14.49</td>
<td>41.73</td>
<td>194,438</td>
<td>2,230,000</td>
<td>1,410,000</td>
</tr>
<tr>
<td>Douglas fir</td>
<td>2,521,000</td>
<td>9.14</td>
<td>42.41</td>
<td>106,259</td>
<td>5,241,000</td>
<td>1,524,000</td>
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<tr>
<td>Red oak</td>
<td>2,434,000</td>
<td>9.11</td>
<td>35.24</td>
<td>85,759</td>
<td>1,180,000</td>
<td>1,254,000</td>
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<tr>
<td>Southern white cedar</td>
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<td>4.05</td>
<td>56.90</td>
<td>60,960</td>
<td>1,061,000</td>
<td>1,061,000</td>
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<tr>
<td>Spruce</td>
<td>1,092,000</td>
<td>4.28</td>
<td>31.86</td>
<td>111,764</td>
<td>300,000</td>
<td>812,000</td>
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<tr>
<td>Shortleaf pine</td>
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<td>1.30</td>
<td>38.74</td>
<td>13,528</td>
<td>450,509</td>
<td>450,509</td>
</tr>
<tr>
<td>Ash</td>
<td>388,700</td>
<td>1.45</td>
<td>41.47</td>
<td>16,118</td>
<td>262,700</td>
<td>128,000</td>
</tr>
<tr>
<td>Cypress (bald)</td>
<td>287,000</td>
<td>1.07</td>
<td>55.61</td>
<td>15,970</td>
<td>287,000</td>
<td>287,000</td>
</tr>
<tr>
<td>Basswood</td>
<td>150,000</td>
<td>0.60</td>
<td>16.00</td>
<td>4,978</td>
<td>5,500</td>
<td>51,500</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>34,000</td>
<td>1.21</td>
<td>53.97</td>
<td>1,820</td>
<td>57,500</td>
<td>57,500</td>
</tr>
<tr>
<td>Teak</td>
<td>61,000</td>
<td>2.4</td>
<td>136.66</td>
<td>12,292</td>
<td>61,000</td>
<td>61,000</td>
</tr>
<tr>
<td>Mahogany</td>
<td>51,000</td>
<td>1.94</td>
<td>194.94</td>
<td>3,570</td>
<td>57,500</td>
<td>57,500</td>
</tr>
<tr>
<td>Hickory</td>
<td>30,000</td>
<td>1.10</td>
<td>53.56</td>
<td>1,536</td>
<td>26,500</td>
<td>1,536</td>
</tr>
<tr>
<td>Sycamore</td>
<td>20,000</td>
<td>0.8</td>
<td>55.34</td>
<td>1,200</td>
<td>24,000</td>
<td>24,000</td>
</tr>
<tr>
<td>Redwood</td>
<td>20,000</td>
<td>0.8</td>
<td>55.34</td>
<td>1,200</td>
<td>24,000</td>
<td>24,000</td>
</tr>
<tr>
<td>Tamarack</td>
<td>15,600</td>
<td>0.61</td>
<td>63.72</td>
<td>971</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Spanish cedar</td>
<td>10,000</td>
<td>0.4</td>
<td>250.00</td>
<td>2,500</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Butternut</td>
<td>10,000</td>
<td>0.4</td>
<td>50.00</td>
<td>300</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>2,500</td>
<td>0.1</td>
<td>29.14</td>
<td>102</td>
<td>2,500</td>
<td>1,000</td>
</tr>
<tr>
<td>Chestnut</td>
<td>3,100</td>
<td>0.11</td>
<td>27.10</td>
<td>74</td>
<td>2,100</td>
<td>2,100</td>
</tr>
<tr>
<td>Black gum</td>
<td>3,500</td>
<td>0.11</td>
<td>70.00</td>
<td>240</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Beech</td>
<td>2,500</td>
<td>0.1</td>
<td>26.00</td>
<td>65</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Sassafras</td>
<td>50</td>
<td>0.00</td>
<td>25.00</td>
<td>30</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>26,716,009</td>
<td>100.00</td>
<td>$38.41</td>
<td>$1,026,722</td>
<td>11,017,200</td>
<td>15,686,900</td>
</tr>
</tbody>
</table>

*Less than 1/100 of 1 per cent.

CASKETS AND COFFINS.

This industry includes, in addition to caskets and coffins, outer or rough boxes and shipping cases. Caskets are the burial cases more universally used. Coffins, at one time in greater demand, are now but relatively seldom employed. They are irregular in form, widest at the part corresponding to the shoulders, narrowing slightly towards the head, and considerably at the feet. The statistics for Pennsylvania show not over 5 per cent. of the wood demanded by the manufacturers was for coffins. More than this amount is used, however, since many coffins are handmade. They are manufactured by cabinetmakers who cater for local trade in all small towns throughout the State. The quantity of wood used by one is small, but for a thickly populated state like Pennsylvania the aggregate consumption would amount to considerable, although it was found impracticable to collect statistics so widely scattered. Black walnut for many years has been the principal coffin wood and it is still called on for the better grades. Cheap coffins are of woods that are soft, easily worked, and at the same time adaptable to stain and polish. Yellow poplar is more used than any other kind for both factory and hand made coffins, in the southern states cypress is the leading coffin material, on the Pacific coast western red cedar, and in the Lake states basswood.
Twelve woods were reported by casket makers. They range from high priced mahogany down to low grades of chestnut and white pine. These burial cases are varied in design, some have an octagonal appearance—the corners instead of being rectangular are cut off and squared. Some have rounded corners, and others are uniformly rectangular. Nearly all are cloth covered and though this permits the use of the lower grades, the lumber selected is free from the defects which would likely affect the strength and durability of the casket. Chestnut is the most used casket wood in all states because it has proved especially durable under ground, and it possesses the combined qualities of lightness and strength, cheapness, and an affinity for glue that holds the cloth. Some of the chestnut used in casket manufacture is of the best, but the largest part is the “sound wormy” grade. As far as durability is concerned this grade is sufficient and the fact that it is perforated with the small worm holes averaging the size of a pin head is an advantage rather than a detriment, as in covering the casket these holes afford an additional hold for the glue. Other woods generally competing as casket material are yellow poplar, red oak, white cedar, cypress, red cedar, white pine, walnut, red gum, white oak, sugar maple, and mahogany. All of them go for cloth covered caskets and some answer for burial cases finished with natural appearance where the wood selected has a handsome grain and is susceptible to the highest polish, similar to that on piano cases. High priced caskets are of this kind and in addition the most expensive are richly carved. The Pennsylvania manufacturers use quartered red oak and white oak, mahogany, and walnut for making these and also to a limited extent red gum, which, from the price paid, must have been selected to imitate Circassian walnut.

The lumber used for outer cases, sometimes called rough boxes, and for shipping cases to protect the coffin or casket in transit, is made of similar woods, but the latter are more carefully manufactured, stronger and neater in appearance. At their destination they serve as rough boxes to receive the casket when put into the ground. White pine in Pennsylvania meets most of the demand and yellow poplar next. Other species reported were western white pine, red cedar, hemlock, chestnut, red oak, and mahogany.

Table 54.—Wood for Caskets and Coffins, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f.o.b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Feet b. m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chestnut</td>
<td>5,397,000</td>
<td>35.23</td>
<td>$10,497</td>
<td>1,572,400</td>
<td>3,833,500</td>
</tr>
<tr>
<td>White pine</td>
<td>4,726,000</td>
<td>31.45</td>
<td>$10,700</td>
<td>1,757,000</td>
<td>4,659,500</td>
</tr>
<tr>
<td>Hemlock</td>
<td>1,050,000</td>
<td>7.15</td>
<td>$10,900</td>
<td>1,995,000</td>
<td>4,893,000</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>34,000</td>
<td>5.35</td>
<td>$10,600</td>
<td>26,850</td>
<td>318,000</td>
</tr>
<tr>
<td>Red oak</td>
<td>6,500</td>
<td>4.76</td>
<td>$10,400</td>
<td>25,800</td>
<td>55,000</td>
</tr>
<tr>
<td>White oak</td>
<td>502,500</td>
<td>3.74</td>
<td>$10,400</td>
<td>23,500</td>
<td>77,500</td>
</tr>
<tr>
<td>Mahogany</td>
<td>331,000</td>
<td>2.87</td>
<td>$10,600</td>
<td>25,200</td>
<td>446,000</td>
</tr>
<tr>
<td>Black walnut</td>
<td>244,000</td>
<td>1.93</td>
<td>$10,800</td>
<td>22,782</td>
<td>331,000</td>
</tr>
<tr>
<td>Red cedar</td>
<td>105,000</td>
<td>1.21</td>
<td>$10,400</td>
<td>1,127,000</td>
<td>169,000</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>35,000</td>
<td>0.25</td>
<td>$10,600</td>
<td>875</td>
<td>35,000</td>
</tr>
</tbody>
</table>
Table 54—Concluded.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Red gum,</td>
<td>30,000</td>
<td>.22</td>
<td>40.00</td>
</tr>
<tr>
<td>Western white pine,</td>
<td>20,000</td>
<td>.14</td>
<td>42.50</td>
</tr>
<tr>
<td>Redwood,</td>
<td>20,000</td>
<td>.14</td>
<td>54.00</td>
</tr>
<tr>
<td>Cherry (black),</td>
<td>20,000</td>
<td>.14</td>
<td>69.00</td>
</tr>
<tr>
<td>Cypress (bald),</td>
<td>20,000</td>
<td>.14</td>
<td>40.00</td>
</tr>
<tr>
<td>Longleaf pine,</td>
<td>6,000</td>
<td>.04</td>
<td>37.50</td>
</tr>
<tr>
<td>Birch,</td>
<td>1,000</td>
<td>.01</td>
<td>24.00</td>
</tr>
<tr>
<td>Total,</td>
<td>13,982,500</td>
<td>100.00</td>
<td>$29.77</td>
</tr>
</tbody>
</table>

MINE EQUIPMENT.

In conjunction with the operation of coal mining, there is usually maintained a wood-working department for the manufacture and repair of all wooden equipment required in connection with the work. Table 55 includes all the kinds of material used for these various purposes except that used in the rough, as props, lagging, caps, segments, sills, etc. In the interior of the mines lumber goes for uses in connection with ventilation schemes; brattices, doors, airways, manways, and for pit railing, etc. On the breakers in collieries it is used for tipple parts, drum bands, chutes, screens, scraper lines, flights, etc., besides it answers for parts of haulage systems, slope rollers for example, and for sprages and various other less important commodities. The lumber used for mine cars and their repair has been included as shown above, under car construction, while that going into manufactured parts for houses, buildings, and other building operations was listed with similar material under the planing mill industry. The available statistics reported by both anthracite and bituminous operations in Pennsylvania are as follows:

Table 55.—Wood for Mine Equipment, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Hemlock,</td>
<td>2,309,750</td>
<td>18.92</td>
<td>$29.52</td>
</tr>
<tr>
<td>White oak,</td>
<td>2,018,927</td>
<td>16.31</td>
<td>15.62</td>
</tr>
<tr>
<td>Black gum,</td>
<td>1,628,460</td>
<td>13.63</td>
<td>21.37</td>
</tr>
<tr>
<td>Hickory,</td>
<td>316,363</td>
<td>6.43</td>
<td>13.51</td>
</tr>
<tr>
<td>Red oak,</td>
<td>867,345</td>
<td>6.76</td>
<td>14.73</td>
</tr>
</tbody>
</table>
Table 55—Concluded.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Feet b. m.</th>
<th>Per cent.</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. a. h. factory.</th>
<th>Feet b. m.</th>
<th>Feet b. m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar maple,</td>
<td>720,290</td>
<td>6.61</td>
<td>18.67</td>
<td>14,731</td>
<td>720,290</td>
<td></td>
</tr>
<tr>
<td>Chestnut,</td>
<td>749,405</td>
<td>6.27</td>
<td>15.42</td>
<td>11,557</td>
<td>749,405</td>
<td></td>
</tr>
<tr>
<td>Beech,</td>
<td>698,325</td>
<td>5.99</td>
<td>17.49</td>
<td>11,781</td>
<td>656,525</td>
<td></td>
</tr>
<tr>
<td>Shortleaf pine,</td>
<td>567,000</td>
<td>4.75</td>
<td>21.14</td>
<td>11,983</td>
<td>567,000</td>
<td></td>
</tr>
<tr>
<td>Longleaf pine,</td>
<td>139,088</td>
<td>1.15</td>
<td>15.73</td>
<td>2,188</td>
<td>159,088</td>
<td>326,998</td>
</tr>
<tr>
<td>Birch,</td>
<td>226,075</td>
<td>2.01</td>
<td>21.23</td>
<td>8,142</td>
<td>236,850</td>
<td></td>
</tr>
<tr>
<td>Pitch pine,</td>
<td>245,000</td>
<td>2.06</td>
<td>23.07</td>
<td>5,675</td>
<td>246,600</td>
<td></td>
</tr>
<tr>
<td>White pine,</td>
<td>225,000</td>
<td>2.00</td>
<td>23.70</td>
<td>5,685</td>
<td>236,600</td>
<td></td>
</tr>
<tr>
<td>Red gum,</td>
<td>150,000</td>
<td>1.26</td>
<td>12.60</td>
<td>1,886</td>
<td>150,000</td>
<td></td>
</tr>
<tr>
<td>Dogwood,</td>
<td>139,088</td>
<td>1.15</td>
<td>15.73</td>
<td>2,188</td>
<td>139,088</td>
<td>226,600</td>
</tr>
<tr>
<td>Ash,</td>
<td>43,425</td>
<td>.39</td>
<td>22.61</td>
<td>966</td>
<td>43,425</td>
<td></td>
</tr>
<tr>
<td>Locust,</td>
<td>31,350</td>
<td>.26</td>
<td>18.18</td>
<td>319</td>
<td>31,350</td>
<td></td>
</tr>
<tr>
<td>Hornbeam,</td>
<td>21,644</td>
<td>.18</td>
<td>13.14</td>
<td>285</td>
<td>21,644</td>
<td></td>
</tr>
<tr>
<td>Yellow poplar,</td>
<td>14,000</td>
<td>.12</td>
<td>22.56</td>
<td>315</td>
<td>14,000</td>
<td></td>
</tr>
<tr>
<td>Cork elm.</td>
<td>8,800</td>
<td>.07</td>
<td>25.14</td>
<td>230</td>
<td>8,800</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11,948,997</strong></td>
<td><strong>100.00</strong></td>
<td><strong>81.52</strong></td>
<td><strong>$223,223</strong></td>
<td><strong>9,172,653</strong></td>
<td><strong>2,775,241</strong></td>
</tr>
</tbody>
</table>

Two commodities included in the above table deserve special mention and to show the kinds of wood used in making them, separate statistics have been arranged and presented in the supplemental tables, 55a, mine rollers, and 55b, sprays.

**MINE ROLLERS.**

Table 55a shows seven woods going into slope rollers. They aggregate nearly 2,500,000 feet of material used annually, but this does not represent wood for rollers that are manufactured elsewhere and brought to the State ready for use. Slope mining in recent years is being superseded by the shaft method and with the change is a corresponding decline in the demand for rollers or pulleys used on the slope to prevent abrasion of the cable against the ground. Two-thirds of the roller material is black gum. That obtained from timber cut in the State is mostly the species, *Nyssa sylvatica*, but that coming from a distance, usually in the form of bolts, is a mixture of the above named species with water gum (*Nyssa biflora*), and a small amount probably of tupelo (*Nyssa aquatica*). Black gum is frequently the common name for all three. The first two species are the most desirable for rollers because of their interlaced fiber that will not splinter nor roughen but wears smooth to a polish by use. Further than this, the woods possess the superior qualities of hardness and toughness, and on account of their abundance, especially in the southern states, are the lowest priced hardwoods. Maple is especially adapted for slope rollers, but owing to its growing scarcity and high price black gum has largely superseded it. Formerly maple was the most used wood for the purpose, but the table shows that the demand for it at present is only one-sixth of that of black gum.

Veneer cores, the symmetrically round pieces left after the veneer has been removed by the rotary cut process, are now being used for making mine rollers, when the species is one of the black gums. These cores are an off-
Table 55a.—Wood for Mine Rollers, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Per cent</th>
<th>Average cost per 1,000 ft</th>
<th>Total cost f. o. b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td></td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Black gum</td>
<td>1,628,560</td>
<td>11.36</td>
<td>$2.39</td>
<td>$39,588</td>
<td>210,216</td>
<td>1,464,744</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>277,200</td>
<td>7.51</td>
<td>2.76</td>
<td>7,482</td>
<td>277,200</td>
<td></td>
</tr>
<tr>
<td>White oak</td>
<td>212,080</td>
<td>6.59</td>
<td>2.57</td>
<td>6,483</td>
<td>212,080</td>
<td></td>
</tr>
<tr>
<td>Birch</td>
<td>322,290</td>
<td>20.70</td>
<td>2.34</td>
<td>5,624</td>
<td>183,200</td>
<td></td>
</tr>
<tr>
<td>Beech</td>
<td>150,360</td>
<td>5.06</td>
<td>2.65</td>
<td>5,990</td>
<td>123,200</td>
<td></td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>32,000</td>
<td>1.87</td>
<td>3.75</td>
<td>120,000</td>
<td>120,000</td>
<td></td>
</tr>
<tr>
<td>Cork elm</td>
<td>8,800</td>
<td>0.50</td>
<td>2.14</td>
<td>5,800</td>
<td>5,800</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2,450,486</td>
<td>100.00</td>
<td>$25.99</td>
<td>$63,431</td>
<td>1,057,096</td>
<td>1,464,744</td>
</tr>
</tbody>
</table>

SPRAGS.

This is a second division of this industry which deserves special attention, not that it represents a commodity that is important in the amount of wood consumed nor economically prominent in the operation of large factories and the use of skilled labor, but because it serves to illustrate the tendency in Pennsylvania towards waste utilization.

A sprag is a cylindrical wooden commodity pointed at each end, about 21 inches long, ranging in thickness from 2 to 3 inches and is used in coal mining operations for checking and regulating the speed of a mine car as it runs in and out of the laterals leading to the shafts. The speed of the car is checked by locking one of its wheels. This occurs when the sprag, having been cast between the spokes of the rotating wheel, strikes against the car still.

Mine cars are not equipped with brakes like freight cars and upon the sprag often depends the safety of the car and more often a train when running downgrade. Sprags must therefore necessarily be very strong and many companies are particular in the specifications of their orders for manufacturing them. Small sprags of not proper thickness are a slight economy, if any, as the frequent breakages entail considerable waste. Also the species of wood used for making them, if not of the requisite strength, hardness, and durability, would in nowise pay in service the expenses of making the sprags.

This industry excludes the softwoods and a number of soft hardwoods, like aspen, yellow poplar, basswood, etc. Chestnut is not suitable owing to lack of sufficient strength, though if easily available and very cheap, it is used to a limited extent. The most practical sprag woods, listed according to amounts, are given in Table 55b following:
Fig. 12.—River scows after being launched, and ready to be taken to market down the Allegheny River.

Fig. 13.—Racing shell being built by a Pennsylvania manufacturer for the University of Pennsylvania.
Fig. 14.—Manufacture of mine sprags in Northern Pennsylvania.

Fig. 15.—Drawing showing standard dimensions of a mine sprag.
Table 55b.—Wood for Sprags, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Per cent</th>
<th>Average cost per 1,000 ft. at factory</th>
<th>Total cost f.o.b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White oak,</td>
<td>1,091,847</td>
<td>34.27</td>
<td>$14.69</td>
<td>$15,256</td>
<td>1,091,847</td>
<td></td>
</tr>
<tr>
<td>Hickory,</td>
<td>816,363</td>
<td>25.62</td>
<td>13.51</td>
<td>11,091</td>
<td>816,363</td>
<td></td>
</tr>
<tr>
<td>Red oak,</td>
<td>612,945</td>
<td>18.23</td>
<td>14.18</td>
<td>8,703</td>
<td>612,945</td>
<td></td>
</tr>
<tr>
<td>Sugar maple</td>
<td>301,269</td>
<td>9.55</td>
<td>13.55</td>
<td>4,121</td>
<td>301,269</td>
<td></td>
</tr>
<tr>
<td>Dogwood,</td>
<td>138,683</td>
<td>4.37</td>
<td>15.73</td>
<td>2,188</td>
<td>138,683</td>
<td></td>
</tr>
<tr>
<td>Beech,</td>
<td>92,325</td>
<td>2.90</td>
<td>16.71</td>
<td>989</td>
<td>92,325</td>
<td></td>
</tr>
<tr>
<td>Ash,</td>
<td>37,425</td>
<td>1.17</td>
<td>23.51</td>
<td>906</td>
<td>37,425</td>
<td></td>
</tr>
<tr>
<td>Locust,</td>
<td>21,370</td>
<td>0.68</td>
<td>10.18</td>
<td>219</td>
<td>21,370</td>
<td></td>
</tr>
<tr>
<td>Chestnut,</td>
<td>28,265</td>
<td>0.84</td>
<td>16.42</td>
<td>281</td>
<td>28,265</td>
<td></td>
</tr>
<tr>
<td>Hornbeam (Ironwood),</td>
<td>21,684</td>
<td>0.63</td>
<td>13.14</td>
<td>285</td>
<td>21,684</td>
<td></td>
</tr>
<tr>
<td>Birch,</td>
<td>10,875</td>
<td>0.34</td>
<td>14.62</td>
<td>159</td>
<td>10,875</td>
<td></td>
</tr>
<tr>
<td>Black gum,</td>
<td>4,500</td>
<td>0.14</td>
<td>29.00</td>
<td>90</td>
<td>4,500</td>
<td></td>
</tr>
<tr>
<td>Hemlock,</td>
<td>750</td>
<td>0.02</td>
<td>13.22</td>
<td>10</td>
<td>750</td>
<td></td>
</tr>
<tr>
<td>Total,</td>
<td>3,186,457</td>
<td>100.00</td>
<td>$13.32</td>
<td>$44,266</td>
<td>3,186,457</td>
<td>4,500</td>
</tr>
</tbody>
</table>

Over 3,000,000 feet of wood is required annually for making sprags in Pennsylvania. This is not representative of all the material that is used as many of these commodities are made by hand and concerning which it is impossible to get information; others are made elsewhere and shipped in for use in Pennsylvania collieries.

Sprags at present are almost entirely made from young timber, pole size; coppice oak and maple being cut for this purpose. This is often a sacrifice of valuable second growth timber since it is practicable to make this commodity from material considered as waste. In that connection the present report may aid in bringing about the utilization of woods waste, like tops, limbs, cut off's, fire killed poles, etc., the most difficult to market of all the off-fall from lumber operations.

In this connection the Department of Forestry of Pennsylvania recently made a valuable experiment, an outline of the results of which will prove of considerable importance not only to mining companies and others owning their own timber, but to all interested in forest conservation.

During the winters of 1911-12 fire killed a stand of oak and chestnut coppice 14 years old on 75 acres in one of the State forests in the northeastern part of Pennsylvania. This timber was not merchantable because of the size and distance from market. The Department of Forestry conceived the idea of its sale in the form of sprags and accordingly arrangements were made with an owner of a sprag machine to move onto the tract and use all suitable timber for making this commodity. A contract was made for manufacturing and delivering the finished product to the nearest shipping point for $9.30 which included, owing to distance, a cost of $4 for wagon transportation. Eleven dollars was the price received for the finished sprags at the siding, leaving a balance of $1.70 a thousand pieces for stumpage. The Department of Forestry scored a success in the undertaking partly because of the revenue received from the fire killed timber, otherwise a waste; also by
this operation a vast amount of what would otherwise have been debris was removed from the woods, assuring less of a tangle when the trees fell and thus allowing a closer fall to the ground and quicker decomposition.

Ten years ago sprags were made with ax and knife, 200 per day being the most one man could produce. Repeated efforts were made to eliminate the manual work by the invention of machinery, but it was not until four years ago that a manufacturer made a successful device which, with the work of two men, enables a possible daily output of from eight to nine thousand sprags. In ordinary commercial runs, however, the average production with this machine is probably not over half the capacity.

FIXTURES.

The fixture manufacturers make certain lines of commodities so closely related to similar ones grouped under the furniture and planing mill industries, that it is difficult at times to determine under which classification they properly belong.

Generally fixtures include furnishings for offices, stores, lodge rooms, saloons, banks, hotel lobbies, lunch rooms, courthouses, churches, dentists' and surgeons' cabinets, account registers, cash registers, index files, and other similar commodities. The materials for making these are distinguished from that going into high class inside house finish such as mantels, colon- nades, cabinet work, and general mill work. The latter are stationary, while fixtures are readily portable. From furniture woods they are separated according to the uses of the finished products, office desks, book cases, store tables, etc., belong to furnishings of business headquarters while commodities of the same name for residences go in the furniture class. Large manufacturers specialize in one or the other lines but in small cities and towns where the local demand does not justify specialization the fixture makers and the planing mills manufacture products belonging to both industries.

Nearly the same woods are employed for fixtures as for furniture but a larger part of the fixture material is of the higher grades. In both industries the woods can be put into two classes, for outside finish and for interior or hidden work. Veneers enter largely into the former class and are growing in favor, chestnut being the favorite backing or core material. For painted work or store counters, bar tops, display racks, show window platforms, and other fixture parts, it is necessary to use solid wood instead of cheaper woods overlaid with veneer. This accounts for the average prices of the woods listed in Table 56 being higher than in the furniture industry.

Yellow poplar, white oak, red oak, and chestnut supply the largest portion of the fixture material in Pennsylvania. Seventy-five per cent. of the quantity used is of these four kinds. Yellow poplar serves both for exterior and interior work. Its adaptability to hold paint and stains, its soft texture and even straight grain make it an easy material to smooth and commend it probably above any other wood for both exterior enameled work and for drawer bottoms, reinforcements, hidden parts of show cases, shelving, interior of wall cases, partitions, etc.

Oak with its ornamental figure is universally the premier fixture wood as it is the foremost furniture wood. Both classes of oaks, red and white, are in demand, and together the amount is greater than that of any other of the woods the Pennsylvania fixture makers purchase. A large part of oak is quartered stock which merely designates the method of sawing. It is the same as rift sawed and arises from first cutting the log into quarters and the quarters into boards, the saw crossing the circles of growth at or nearly at right angles. Oak shows more figure when the log is sliced ordinarily into
boards but the pleasing effect of rift sawing is more in favor and besides being desired by the fixture makers on account of minimum shrinkage and warp. Birch is ahead of any other domestic wood for imitating mahogany. The heartwood of the tree is used for this work. The sapwood has a much lighter color but like the heartwood is specially adapted to take stain and receive and hold a soft brilliant polish. Besides mahogany, birch can readily be stained to imitate cherry, Circassian walnut, fumed oak, bog oak, black walnut, and other pleasing effects. The figure of curly birch is especially attractive and it brings high prices, going into the highest grades of fixtures. Other finishing woods are mahogany, sugar maple, including large quantities of bird's eye maple, cherry, red gum, black walnut, butternut, and Circassian walnut. The last named is the most expensive wood and goes only into the most expensive work. Red gum and butternut are frequently found richly mottled and in some respects resembling Circassian walnut. For that reason they are most frequently used of any domestic wood to be finished in imitation of this foreign wood.

This industry calls on the State for only a limited portion of its raw material. Only a little more than one-third of the total was reported as home cut and of the entire amount of eleven of the woods shipped in from other states, two-thirds were oak and yellow poplar which being demanded in high grades made it necessary to obtain a large portion in regions where the virgin stands of these species are the most abundant. States in the southern Appalachians furnished most of this material. Of the woods listed in the fixture table that are abundantly cut in Pennsylvania the chestnut, birch, sugar maple, basswood, cherry, beech, ash, black walnut, and butternut, most of the supply used was State-grown. The fixture manufacturers, therefore, like the other class of manufacturers using home-grown material should be vitally interested in conservation and the movement looking to the State's future timber supply.

Table 56.—Wood for Fixtures, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>227,090</td>
<td>18.82</td>
<td>887.21</td>
<td>858,229</td>
</tr>
<tr>
<td>White oak</td>
<td>2,127,110</td>
<td>17.89</td>
<td>69.79</td>
<td>1,271,184</td>
</tr>
<tr>
<td>Red oak</td>
<td>2,100,520</td>
<td>17.67</td>
<td>41.36</td>
<td>86,500</td>
</tr>
<tr>
<td>Chestnut</td>
<td>1,018,770</td>
<td>15.17</td>
<td>26.16</td>
<td>45,940</td>
</tr>
<tr>
<td>Birch</td>
<td>382,300</td>
<td>7.00</td>
<td>36.00</td>
<td>39,461</td>
</tr>
<tr>
<td>White pine</td>
<td>432,450</td>
<td>8.10</td>
<td>46.64</td>
<td>29,640</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>366,000</td>
<td>6.68</td>
<td>23.17</td>
<td>8,482</td>
</tr>
<tr>
<td>Mahogany</td>
<td>327,420</td>
<td>8.30</td>
<td>153.15</td>
<td>44,910</td>
</tr>
<tr>
<td>Basswood</td>
<td>289,100</td>
<td>2.27</td>
<td>33.92</td>
<td>9,128</td>
</tr>
<tr>
<td>Red and silver maple</td>
<td>369,000</td>
<td>2.19</td>
<td>15.00</td>
<td>2,900</td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>256,000</td>
<td>2.15</td>
<td>25.22</td>
<td>6,625</td>
</tr>
<tr>
<td>Lobolly pine</td>
<td>153,000</td>
<td>1.29</td>
<td>32.17</td>
<td>2,292</td>
</tr>
<tr>
<td>Cherry (black)</td>
<td>128,700</td>
<td>1.08</td>
<td>66.14</td>
<td>8,312</td>
</tr>
<tr>
<td>Cypress (bald)</td>
<td>111,900</td>
<td>0.94</td>
<td>27.28</td>
<td>4,178</td>
</tr>
<tr>
<td>Red gum</td>
<td>94,000</td>
<td>0.79</td>
<td>44.90</td>
<td>1,106</td>
</tr>
<tr>
<td>Beech</td>
<td>71,000</td>
<td>0.60</td>
<td>21.55</td>
<td>1,551</td>
</tr>
<tr>
<td>Ash</td>
<td>49,900</td>
<td>0.42</td>
<td>68.62</td>
<td>2,925</td>
</tr>
<tr>
<td>Hemlock</td>
<td>44,300</td>
<td>0.37</td>
<td>28.61</td>
<td>1,150</td>
</tr>
<tr>
<td>Cottonwood</td>
<td>40,000</td>
<td>0.34</td>
<td>32.50</td>
<td>1,549</td>
</tr>
<tr>
<td>Longleaf pine</td>
<td>38,563</td>
<td>0.33</td>
<td>32.41</td>
<td>1,209</td>
</tr>
</tbody>
</table>

---

$89$
Table 56—Concluded.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Per cent</th>
<th>Average cost</th>
<th>Total cost</th>
<th>Grown in</th>
<th>Grown Out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td>per 1,000 ft.</td>
<td>Feet b. m.</td>
<td></td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Black walnut</td>
<td>25,569</td>
<td>.30</td>
<td>82.91</td>
<td>7,873</td>
<td>28,800</td>
<td>7,600</td>
</tr>
<tr>
<td>Sugar pine,</td>
<td>35,600</td>
<td>.21</td>
<td>65.00</td>
<td>1,635</td>
<td>25,600</td>
<td></td>
</tr>
<tr>
<td>Western white pine</td>
<td>20,500</td>
<td>.17</td>
<td>46.78</td>
<td>959</td>
<td>20,600</td>
<td></td>
</tr>
<tr>
<td>Pitch pine,</td>
<td>20,000</td>
<td>.17</td>
<td>16.69</td>
<td>339</td>
<td>12,500</td>
<td></td>
</tr>
<tr>
<td>Battenet,</td>
<td>12,500</td>
<td>.11</td>
<td>44.20</td>
<td>588</td>
<td></td>
<td>12,500</td>
</tr>
<tr>
<td>Spruce,</td>
<td>1,500</td>
<td>.01</td>
<td>42.00</td>
<td>63</td>
<td></td>
<td>1,500</td>
</tr>
<tr>
<td>Black gum,</td>
<td>1,000</td>
<td>.01</td>
<td>28.00</td>
<td>38</td>
<td></td>
<td>1,000</td>
</tr>
<tr>
<td>Hickory,</td>
<td>1,000</td>
<td>.01</td>
<td>65.69</td>
<td>63</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Redwood,</td>
<td>500</td>
<td></td>
<td>35.00</td>
<td>38</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Circassian walnut</td>
<td>500</td>
<td></td>
<td>250.00</td>
<td>125</td>
<td></td>
<td>500</td>
</tr>
<tr>
<td>Total,</td>
<td>11,388,230</td>
<td>100.00</td>
<td>$12.25</td>
<td>$622,322</td>
<td>3,685,310</td>
<td>8,392,810</td>
</tr>
</tbody>
</table>

*Less than 1-10 of 1 per cent.

CLOTH, HOSIERY BOARDS, ETC.

Cloth boards, commonly called wrapping boards, upon which to wind woolen and other textile goods, hosiery boards used in stocking factories and stores, hammer boards for beating brass and other sheet metals, and lap boards used by the seamstress, are the commodities which have been classed under Table 57. The largest part of the total was for cloth boards and the species used were loblolly pine, shortleaf pine, yellow poplar, and white pine. The size of cloth boards varies from 6 to 8 inches wide and from 16 to 20 inches long and one-fourth to five-eighths of an inch thick.

Sugar maple supplies the entire demand for hosiery boards or driers. They are made of % inch material which is strong, dense and not liable to roughen up or splinter. Yellow poplar sufficed for sewing or lap boards and for stocking forms. Because maple does not split easily and is strong and hard, it is preferred of all woods for hammer boards. Considerable material is used in Pennsylvania for the manufacture of ironing and sleeve boards, meat, pastry, and steak boards or planks, but these have been listed and referred to under the industry entitled "Woodenware."

Table 57—Wood for Boards, Cloth, Hosiery, etc., year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Per cent</th>
<th>Average cost</th>
<th>Total cost</th>
<th>Grown in</th>
<th>Grown Out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td>per 1,000 ft.</td>
<td>Feet b. m.</td>
<td></td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>8,000,000</td>
<td>67.94</td>
<td>$25.60</td>
<td>$200,000</td>
<td>8,000,000</td>
<td></td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>1,070,000</td>
<td>9.66</td>
<td>28.35</td>
<td>31,140</td>
<td>1,070,000</td>
<td></td>
</tr>
<tr>
<td>White pine,</td>
<td>1,000,000</td>
<td>8.49</td>
<td>32.69</td>
<td>32,000</td>
<td>1,000,000</td>
<td></td>
</tr>
<tr>
<td>Loblolly pine</td>
<td>1,000,000</td>
<td>8.40</td>
<td>35.33</td>
<td>35,330</td>
<td>1,000,000</td>
<td></td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>706,000</td>
<td>5.96</td>
<td>46.45</td>
<td>33,700</td>
<td>555,000</td>
<td></td>
</tr>
<tr>
<td>Total,</td>
<td>11,775,000</td>
<td>100.00</td>
<td>$25.60</td>
<td>$214,315</td>
<td>50,000</td>
<td>11,725,000</td>
</tr>
</tbody>
</table>
PATTERNS AND FLASKS.

Table 58 shows that nearly eleven and a half million feet of lumber are required annually in Pennsylvania for making patterns, flasks, and for other needs of the moulders and foundrymen. Of this amount nearly 80 per cent. is white pine. All of this did not go for patterns, since white pine was demanded for flasks in greater amounts than was any other wood. It is, however, the predominant pattern wood not alone in Pennsylvania, but throughout the country at large. Its suitability is due above all to its susceptibility to hold shape under atmospheric changes, to its grain being close, straight, and even, with obscure figure, to its being easily worked, and at the same time not so soft as to be injured by rough usage, and to its being light in weight and easily portable. Since the pattern must be designed in the exact shape and dimensions of the article to be moulded, the highest grades of lumber are required, and, in many cases, material of considerable width is required and is usually often quarter-sawed, which will not warp as easily as straight sawn lumber cut without regard to grain. These are the factors which have increased the cost of this species to the point of creating a demand for a substitute wood. Thus far no kind of wood experimented upon has been equal to white pine. It will be noticed that the western white pine cut in the Rocky Mountains appears in the table and also the sugar pine of California. Neither of these woods can be distinguished at sight from the eastern white pine. The western white pine is heavier than the eastern, and the sugar pine more resinous. The kinds of wood used for patterns in Pennsylvania are as follows:

<table>
<thead>
<tr>
<th>White pine.</th>
<th>Yellow poplar.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cherry.</td>
<td>White oak.</td>
</tr>
<tr>
<td>Mahogany.</td>
<td>Black walnut.</td>
</tr>
<tr>
<td>Sugar maple.</td>
<td>Butternut.</td>
</tr>
<tr>
<td>Sugar pine.</td>
<td>Teak.</td>
</tr>
<tr>
<td>Western white pine.</td>
<td>Silver maple.</td>
</tr>
<tr>
<td>Redwood.</td>
<td></td>
</tr>
</tbody>
</table>

Standard patterns, or patterns used often and therefore submitted to considerable wear, are made as durable as possible. For these very hard dense wood is required and mahogany, cherry, butternut, sugar maple, black walnut, and teak wood—the latter a foreign wood—are the ones used in Pennsylvania. Large patterns, like those for moulding massive machine parts can not with economy be used entirely of these woods. Only the parts that come in direct contact with the sand, where the greatest wear is, are made of hardwoods, the inside or filler being of a softer, cheaper wood, and one more easily worked, such as white pine, sugar pine, yellow poplar, or redwood. Mahogany is the best of the hardwoods for patterns, though cherry is the favorite of the domestic woods. These are of even straight grain and less liable to shrink and swell when enclosed in the matrices of damp sand. In addition they stand well the ramming, knocking, and rough usage a standard pattern receives. Sugar maple would be more used than it is were it not for its tendency to warp. Being hard, of straight, compact structure, with a capacity to wear smooth, and easily worked, it otherwise possesses excellent qualities for pattern material.

For flasks lower grades of lumber are required than for patterns. Flasks serve as the frame or box, holding the sand in which to make the mould. A two-part flask is used when the pattern is in two pieces, one resting upon the other, the upper part is the cope, the lower the novel. Flask material does not last long, its destruction being due more to frequent burning than to the general rough wear. The firing results from intense heat of the sand after the molten metal is poured into the mould. Buckets of water are conveniently
at hand to extinguish a blaze as soon as it is discovered. Wood slow to take fire is the best flask material, though choice is usually limited to kinds near at hand or that are cheap. Redwood, when not too costly is preferred, because it is generally conceded to be more fireproof than any other domestic wood. Coating the inside of flasks with a fireproof chemical has been tried recently as an experiment. Flask woods in order of their importance in Pennsylvania are as follows:

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Per cent.</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loblolly pine</td>
<td>242,012</td>
<td>2.11</td>
<td>20.85</td>
<td>5,056</td>
<td>232,012</td>
<td>284,000</td>
</tr>
<tr>
<td>Hemlock</td>
<td>234,000</td>
<td>2.01</td>
<td>20.70</td>
<td>4,844</td>
<td>234,000</td>
<td>284,000</td>
</tr>
<tr>
<td>White pine</td>
<td>9,141,449</td>
<td>79.53</td>
<td>$56.09</td>
<td>$512,735</td>
<td>2,276,138</td>
<td>6,865,251</td>
</tr>
<tr>
<td>Longleaf pine</td>
<td>128,390</td>
<td>1.11</td>
<td>19.24</td>
<td>4,466</td>
<td>28,000</td>
<td>99,700</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>86,844</td>
<td>.76</td>
<td>71.58</td>
<td>6,220</td>
<td>54,644</td>
<td>32,250</td>
</tr>
<tr>
<td>Mahogany</td>
<td>86,288</td>
<td>.75</td>
<td>124.82</td>
<td>16,777</td>
<td>58,258</td>
<td></td>
</tr>
<tr>
<td>Sugar maple</td>
<td>50,500</td>
<td>.44</td>
<td>47.46</td>
<td>2,309</td>
<td>38,550</td>
<td>11,700</td>
</tr>
<tr>
<td>Sugar pine</td>
<td>50,000</td>
<td>.43</td>
<td>53.00</td>
<td>2,250</td>
<td>38,550</td>
<td>11,700</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>45,500</td>
<td>.40</td>
<td>38.83</td>
<td>1,805</td>
<td>37,500</td>
<td>9,000</td>
</tr>
<tr>
<td>Pitch pine</td>
<td>41,000</td>
<td>.38</td>
<td>20.84</td>
<td>917</td>
<td>41,500</td>
<td>2,560</td>
</tr>
<tr>
<td>Norway pine</td>
<td>42,010</td>
<td>.37</td>
<td>25.69</td>
<td>1,255</td>
<td>28,000</td>
<td>43,040</td>
</tr>
<tr>
<td>Western white pine</td>
<td>28,000</td>
<td>.21</td>
<td>54.25</td>
<td>1,554</td>
<td>28,000</td>
<td></td>
</tr>
<tr>
<td>White oak</td>
<td>24,000</td>
<td>.21</td>
<td>56.50</td>
<td>945</td>
<td>24,000</td>
<td></td>
</tr>
<tr>
<td>White elm</td>
<td>15,000</td>
<td>.13</td>
<td>33.00</td>
<td>453</td>
<td>15,000</td>
<td></td>
</tr>
<tr>
<td>Black walnut</td>
<td>14,500</td>
<td>.13</td>
<td>50.00</td>
<td>725</td>
<td>4,500</td>
<td>10,000</td>
</tr>
<tr>
<td>Red oak</td>
<td>12,000</td>
<td>.10</td>
<td>25.00</td>
<td>300</td>
<td>12,000</td>
<td></td>
</tr>
<tr>
<td>Beech</td>
<td>10,000</td>
<td>.09</td>
<td>25.00</td>
<td>250</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Butternut</td>
<td>5,210</td>
<td>.05</td>
<td>72.83</td>
<td>416</td>
<td>5,210</td>
<td>1,210</td>
</tr>
<tr>
<td>Teak</td>
<td>1,400</td>
<td>.01</td>
<td>25.00</td>
<td>350</td>
<td>1,400</td>
<td></td>
</tr>
<tr>
<td>Red and silver maple</td>
<td>1,000</td>
<td>.01</td>
<td>50.00</td>
<td>50</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Black gum</td>
<td>500</td>
<td>.01</td>
<td>21.00</td>
<td>12</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>11,485,019</td>
<td>100.00</td>
<td>$31.36</td>
<td>$5,087,706</td>
<td>2,387,092</td>
<td>8,007,919</td>
</tr>
</tbody>
</table>

*Less than 1/100 of 1 per cent.

The Pennsylvania forests furnished only one-fourth of the total pattern material used. This was probably due to the diminishing stand of white pine timber in the State of the size demanded by the high grade lumber pattern makers. Nearly seven-ninths of all that was used was shipped in from West Virginia, the Great Lakes region, and western states.
### HANDLES.

Other states take precedence over Pennsylvania in the quantity of wood annually consumed in the manufacture of handles, but it is probable that none surpasses it in the different kinds of handles made. The principal ones reported have been listed and the woods from which they are made arranged in order of quantity as follows:

<table>
<thead>
<tr>
<th>Axe Handles</th>
<th>Fork Handles</th>
</tr>
</thead>
<tbody>
<tr>
<td>White ash</td>
<td>White ash</td>
</tr>
<tr>
<td>Hickory</td>
<td>Cherry</td>
</tr>
<tr>
<td>White oak</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brick Trowel Handles</th>
<th>Grab Maul Handles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dogwood</td>
<td>Hornbeam</td>
</tr>
<tr>
<td>Persimmon</td>
<td>Hickory</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Broom Handles</th>
<th>Hammer Handles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basswood</td>
<td>White ash</td>
</tr>
<tr>
<td>Beech</td>
<td>Hickory</td>
</tr>
<tr>
<td>Sugar maple</td>
<td></td>
</tr>
<tr>
<td>Birch</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Butcher Knife Handles</th>
<th>Hutchet Handles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birch</td>
<td>Hickory</td>
</tr>
<tr>
<td>Beech</td>
<td>White ash</td>
</tr>
<tr>
<td>Sugar maple</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cant Hook Handles</th>
<th>Hoe Handles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar maple</td>
<td>White ash</td>
</tr>
<tr>
<td>Hornbeam</td>
<td>Sugar maple</td>
</tr>
<tr>
<td>Hickory</td>
<td>Beech</td>
</tr>
<tr>
<td></td>
<td>Birch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Carrying Poles</th>
<th>Instrument Handles</th>
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<tbody>
<tr>
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</tr>
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<td>Hickory</td>
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<thead>
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<th>Chisel Handles</th>
<th>Jack Handles</th>
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<tr>
<td></td>
<td>Sugar maple</td>
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<table>
<thead>
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</tr>
<tr>
<td>White ash</td>
<td>Hickory</td>
</tr>
<tr>
<td>Sweet birch</td>
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<table>
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<th>Concrete Rammer Handles</th>
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<table>
<thead>
<tr>
<th>Crosscut Saw Handles</th>
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<tr>
<td>Sugar maple</td>
<td>Sugar maple</td>
</tr>
<tr>
<td>Hickory</td>
<td>Birch</td>
</tr>
<tr>
<td></td>
<td>Basswood</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Door Knobs</th>
<th>Peavey Handles</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Hornbeam</td>
</tr>
<tr>
<td></td>
<td>Hickory</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D-Fork Handles</th>
<th>Pick Handles</th>
</tr>
</thead>
<tbody>
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<td>Hickory</td>
</tr>
<tr>
<td></td>
<td>White oak</td>
</tr>
<tr>
<td></td>
<td>Hornbeam</td>
</tr>
</tbody>
</table>
Pipe Wrench Handles.
Basswood.

Plastering Trowel Handles.
Basswood.

Pole Brush Handles.
Basswood.
White ash.
Shortleaf pine.

Rake Handles.
Sugar maple.
Beech.
Birch.
Ash.

Saddler's Tool Handles.
Black walnut.

Sword Iron Handles.
Red gum.

Sand Rammer Handles.
Hickory.
Hornbeam.

Saw Frames.
Red Oak.
Birch.
Sugar maple.

Saw Handles.
Red gum.
Sweet birch.
Applewood.
Beech.

Spade Handles.
White ash.
Black ash.

Spud Handles.
Hickory.
Hornbeam.
Sugar maple.
Beech.

Stomper Handles.
Hornbeam.
Hickory.

Street Brooms.
Beech.
Sugar maple.
Hickory.

Track Tool Handles.
White oak.
Hickory.
Sugar maple.
White ash.

Hickory is unquestionably the best wood used for long-handle tools, including the maul, axe, striking hammer, sledge, and track tools used on railroads for construction work and for maintenance of way. Besides exceptional strength, this wood possesses other important qualities for handle material,—weight, stiffness, shock-resisting ability, and susceptibility to wear smooth by use. Manufacturers of this class of handles usually specialize in this line, since the processes of manufacture and the machinery required are distinct from those employed in making other classes. Hickory is becoming scarcer each year, and this fact has induced a number of northern handle makers to move southward nearer to the source of the largest supply. Not a few firms, however, continue to maintain factories in the north and to ship billets, bolts, and rough-turned handle stock from the south to the north as far as Connecticut and New Hampshire.

It is interesting to note from the following table that the Pennsylvania hickory handle manufacturers procure 66 per cent. of their raw material from the State. It would be well for farmers and timber owners in Pennsylvania who own stands of hickory to understand the increasing demand for the wood for handles and that second-growth hickory is preferred. This tree is not a rapid grower but it is not so slow as many other trees and it will soon prove a good investment to preserve stands of second-growth hickory to aid their development, and to cut the timber only as it becomes large enough for handle bolts. The list given below shows the kinds of wood which are being tried as substitutes for hickory in handle making, white oak, cow oak, swamp oak, sugar maple, hornbeam, and ash being the principal ones. For coal-pick handles these woods are suitable and most largely used, there being less strain as to strength and shock-resisting than if used for the more strenuous work of the pick, axe, and maul.
The manufacture of fork and garden tool handles is another distinct class of this industry. What hickory is for the axe, pick, and sledge, white ash is to this class, namely, the pitch-fork and hay-fork, the long handle and D-shovel, and the hoe, rake, etc. Stiffness, toughness, and strength without excessive weight are the properties which commend ash for this use. It is surprising that the handle manufacturers demanding this wood procure only 58 per cent. of their requirements from State-grown woods. This condition offers another opportunity to timber owners to encourage the growing of ash for handle stock, to meet the demand of the increasing home market. In forest management ash is an important tree. It is a fairly rapid grower and is not particular as to situation, as are many other trees.

Other woods serve with ash for meeting the demand for this class of handles, but they are used in considerably smaller quantities. In the order of their importance, they are sugar maple, beech, birch, and cherry. In other states elm, sycamore, and soft maple are included.

More wood in Pennsylvania is required for broom and mop handles than for any other class, and like hickory handles, the manufacturer makes no other kinds. The maples, chiefly sugar maple, the birches and beech because they turn well and wear smooth in use, and to a less extent, basswood, red gum, ash, and sycamore, are the broom and mop handle woods; and all of them are reported being used in Pennsylvania. Sugar maple is preferred and only a few years ago was most used. Its demand for other uses at higher prices is probably the chief cause for bringing birch into first place. High grade material is required for broom handles and squares are usually cut direct from the log, the less desirable being put into mop handles. Mop handle squares were found being bolted in Pennsylvania from slabs and edgings of sawmills cutting beech, birch, and maple.

For handles where weight is not an objection and strength is the foremost consideration, hornbeam or ironwood has been found very satisfactory. Cant hook and peavey handles, stomper and rammer handles are examples.

Applewood is very well adapted for handsaw handles, being hard, sufficiently strong, of uniform texture, and susceptible of high polish. The attractive uniform color has caused it to become the principal wood for better grades of handles. Red gum, cherry, and sweet birch have proved satisfactory for saw handles, but more because they can be finished to resemble applewood closely than because of any other special quality which they possess. Beech furnishes the material for cheaper grades. Its color is against it and also the fact that it is not capable of high polish, but its toughness and greater strength and ability to wear smooth probably make it nearly equal to applewood. Other woods used for saw handles but not reported in Pennsylvania are mahogany and black walnut. Saw frames for buck saws are of red oak, birch, and maple and handles of crosscut saws are of sugar maple, hickory, and beech.

The bricklayers' trowels have handles of dogwood and persimmon. These woods are dense in structure and among the hardest domestic woods and therefore best stand the wear for use as a hammer for imbedding the brick into mortar after placing it. The plaster trowels are made of basswood. Being porous this wood absorbs the moisture from the wet hand of the mechanic and it is claimed does not slime. In the New England states popple or aspen is used for the same reason.
Table 59.—Wood for Handles, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average. cost at factory.</td>
</tr>
<tr>
<td>Hickory,</td>
<td>2,673,250</td>
<td>36.07</td>
<td>$31 97</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>2,367,850</td>
<td>29.95</td>
<td>19 62</td>
</tr>
<tr>
<td>Ash,</td>
<td>1,995,720</td>
<td>26.45</td>
<td>26 45</td>
</tr>
<tr>
<td>Beech,</td>
<td>1,752,300</td>
<td>24.15</td>
<td>17 31</td>
</tr>
<tr>
<td>Hornbeam,</td>
<td>413,500</td>
<td>5.77</td>
<td>19 53</td>
</tr>
<tr>
<td>Birch,</td>
<td>207,750</td>
<td>2.89</td>
<td>18 13</td>
</tr>
<tr>
<td>Red gum,</td>
<td>156,990</td>
<td>2.17</td>
<td>22 38</td>
</tr>
<tr>
<td>White oak,</td>
<td>59,000</td>
<td>0.84</td>
<td>27 45</td>
</tr>
<tr>
<td>Applewood,</td>
<td>50,000</td>
<td>0.71</td>
<td>40 00</td>
</tr>
<tr>
<td>Basswood,</td>
<td>41,200</td>
<td>0.58</td>
<td>29 73</td>
</tr>
<tr>
<td>Red oak,</td>
<td>15,000</td>
<td>0.21</td>
<td>17 50</td>
</tr>
<tr>
<td>Shortleaf pine,</td>
<td>12,000</td>
<td>0.16</td>
<td>20 00</td>
</tr>
<tr>
<td>Cherry (black)</td>
<td>7,500</td>
<td>0.10</td>
<td>25 00</td>
</tr>
<tr>
<td>Persimmon,</td>
<td>7,000</td>
<td>0.09</td>
<td>27 00</td>
</tr>
<tr>
<td>Black walnut,</td>
<td>1,000</td>
<td>0.01</td>
<td>61 90</td>
</tr>
<tr>
<td>Ebony,</td>
<td>237</td>
<td>*</td>
<td>300 81</td>
</tr>
<tr>
<td>Dogwood,</td>
<td>239</td>
<td>*</td>
<td>67 57</td>
</tr>
<tr>
<td>Rosewood,</td>
<td>100</td>
<td>*</td>
<td>300 09</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11,914,307</td>
<td>100.00</td>
<td>$36 68</td>
</tr>
</tbody>
</table>

*Less than 1-100 of 1 per cent.

LAUNDRY APPLIANCES.

The fourteen woods demanded by the Pennsylvania manufacturers for making laundry accessories are listed in Table 60 following and they aggregate a cut of over nine million feet. Four woods, sugar maple, beech, birch, and yellow poplar, contributed nearly 70 per cent. of the total. Of these sugar maple is the most important, in quantity furnishing more than one-half of the entire demand. Four woods were cut entirely outside of the State but nearly three-fourths of the aggregate employed grew in Pennsylvania, showing to what extent this industry is dependent upon the forest resources of the State and why manufacturers should be interested in the movement to protect and improve the forests.

Clothespins are the smallest commodity grouped under this heading but they are not the least important as more wood is used for their manufacture than for any other laundry product. Over four million feet is the amount annually required. Fine grained beech and sugar maple in nearly equal quantities were the principal woods used. The other kinds include birch and yellow poplar. The last named and maple also are used for making clip pins, which are two wooden scales held together by a wire spring. The woods used in Pennsylvania as clothespin material are the same as those used in other states except in Virginia where the manufacturers report black gum, both the water gum and cotton gum varieties, which in those parts are indiscriminately called black gum. Three processes are necessary in the manufacture of clothespins, (1) the rough billets are turned to proper form, (2) they are put through another machine which slits them, (3) they are finally consigned into revolving cylinders to be tumbled or smoothed by abrasion.
Ironing boards and stands are an important part of this industry and the woods used are selected according to their fitness for the several parts. The frames or the collapsible stand upon which the boards rest require a strong wood and one that turns readily. Sugar maple and beech are reported in Pennsylvania while in Michigan elm and yellow birch joined with these in furnishing this material. Ironing boards are preferably of a wood that is soft and easily smoothed and one that in the presence of high temperature holds its shape well. It should be made of light weight wood so as to be easily portable. Cottonwood answers well but buckeye, basswood, yellow poplar, and white pine are probably the favorites. Besides regular-size ironing boards, these woods were also reported for skirt and sleeve boards used for specialty work.

Beech, birch, and maple, because they are strong, tough, and not easily split, were reported for making clothes racks, sometimes called horses, and for clothes driers. Light weight wood like basswood or aspen were used for the stringers. The racks are made of turned stock and fold together like a screen. The driers are revolving reels through the arms of which wire is strung for hanging clothes. These include the ones that are temporarily attachable to back porches of apartment buildings and also the kinds that are placed in back yards. Adjustable curtain stretchers used in laundering lace and other thin fabric window curtains are included in this industry. Basswood was the only wood used while a large amount of loblolly pine was called on for clothes props.

Mangles are ironing machines used for domestic purposes in ironing flat work such as table and bed linen, towels, handkerchiefs, etc. In appearance they resemble clothes wringers, having their rolls operating at a tangent. Some of them are intended only for cold ironing or smoothing. In these the rolls are of wood and the pressure of the rolls alone does the work giving the clothes the same smooth appearance as if hot ironed. In Pennsylvania they are made alone of sugar maple but the Michigan report also shows beech and elm though in much smaller quantities. Machines are also made for hot ironing and in these the upper roll is hollow metal heated while the lower one is wood covered with padding and a top dress of muslin. Mangle rollers vary in size from 3\(\frac{1}{2}\) inches in diameter and 20 inches long to 6 inches diameter and 24 inches long.

Washing machines are of various designs and shapes, some in box form, some conical shape similar to a wash tub, and others are cylindrical. The last named is the design used in steam laundries. Cypress is more suitable than any other wood for washing machine bodies because it is less liable to warp and more durable in situations of alternating moisture and dryness. Ash and to a small extent white pine were also reported. Of the Pacific coast woods, redwood seems to give the best result. On account of the strength of sugar maple it was called on for the legs of washing machines; and beaters or agitators which work inside of the machine to turn the clothes in washing are made of beech or maple.

The reasons which commend cypress for washing machines make it the principal wood for wash tubs. In Michigan spruce was the favorite wood while the Illinois manufacturers used cypress, cotton gum, and red gum in the order named. The increasing use of these woods, especially cotton gum, which is tupelo, is worthy of note.

For washboards, the manufacturers require woods that are light in color, especially for the print board, which is stencilled. Yellow poplar alone is called on in this State but in Ohio, Illinois, and Michigan, basswood, cottonwood, and cotton gum were demanded. Washboard sides or posts are
made from beech and sugar maple. The former is more extensively used. The rubbing surface at one time was made of maple and beech, but now metal or glass rubs have been substituted.

Table 60.—Wood for Laundry Appliances, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity, Feet b. m.</th>
<th>Per cent</th>
<th>Average cost per 1,000 ft. at factory</th>
<th>Total cost in 1,000 b. factory.</th>
<th>Grown in Pennsylvania, Feet b. m.</th>
<th>Grown Out of Pennsylvania, Feet b. m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar maple,</td>
<td>6,340,500</td>
<td>55.73</td>
<td>22.75</td>
<td>1,568.613</td>
<td>3,285,500</td>
<td>2,355,000</td>
</tr>
<tr>
<td>Beech</td>
<td>1,232,000</td>
<td>10.10</td>
<td>12.56</td>
<td>23,842</td>
<td>1,352,000</td>
<td>350,000</td>
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<tr>
<td>Birch</td>
<td>1,000,000</td>
<td>8.05</td>
<td>11.72</td>
<td>13,860</td>
<td>1,070,000</td>
<td>30,000</td>
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<tr>
<td>Yellow poplar</td>
<td>800,000</td>
<td>6.63</td>
<td>16.44</td>
<td>10,630</td>
<td>500,000</td>
<td>110,000</td>
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<tr>
<td>Cottonwood</td>
<td>500,000</td>
<td>4.02</td>
<td>32.90</td>
<td>10,459</td>
<td></td>
<td>960,000</td>
</tr>
<tr>
<td>Basswood</td>
<td>427,000</td>
<td>3.53</td>
<td>32.53</td>
<td>12,910</td>
<td>1,065,000</td>
<td>339,500</td>
</tr>
<tr>
<td>Yellow oak</td>
<td>125,000</td>
<td>1.06</td>
<td>32.00</td>
<td>3,500</td>
<td>350,000</td>
<td>339,500</td>
</tr>
<tr>
<td>Red and silver maple</td>
<td>30,000</td>
<td>0.24</td>
<td>32.00</td>
<td>1,300</td>
<td>42,500</td>
<td>37,500</td>
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<tr>
<td>Lime tree</td>
<td>75,000</td>
<td>0.62</td>
<td>33.92</td>
<td>2,999</td>
<td>25,000</td>
<td>52,200</td>
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<tr>
<td>Cypress (bald)</td>
<td>39,000</td>
<td>0.32</td>
<td>39.10</td>
<td>1,535</td>
<td></td>
<td>39,000</td>
</tr>
<tr>
<td>White oak</td>
<td>20,000</td>
<td>0.17</td>
<td>32.50</td>
<td>705</td>
<td>10,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Red oak</td>
<td>30,000</td>
<td>0.24</td>
<td>32.50</td>
<td>705</td>
<td>10,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Chestnut</td>
<td>3,000</td>
<td>0.02</td>
<td>24.00</td>
<td>72</td>
<td>2,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Ash</td>
<td>1,000</td>
<td>0.01</td>
<td>32.00</td>
<td>25</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Total</td>
<td>10,785,700</td>
<td>100.00</td>
<td>22.17</td>
<td>2,339,356</td>
<td>6,011,500</td>
<td>4,164,200</td>
</tr>
</tbody>
</table>

CIGAR BOXES.

Cigar boxes are the only wooden tobacco containers made in Pennsylvania and the woods required solely for this purpose are listed in Table 61. In a number of southern states, plug and twist tobacco boxes were included with cigar box lumber and the factories known as the tobacco box industry. Cigar box material is bought as thin lumber and veneer, the former usually 5-32 of an inch in thickness. This material, as is customary in commerce, was reported in terms of superficial feet. To make it comparable with the other tables of this report, however, it was reduced to board measure and valued on that basis. For this reason the cost of the material may appear somewhat high, especially since the cost of manufacture has not been eliminated nor has any allowance been made for waste. The prices range from $20 to $30 per thousand feet surface measure for Spanish cedar, $12.50 to $18.50 for yellow poplar and basswood and $14 to $17.50 for cotton gum and red gum.

Though the eastern part of Pennsylvania raises the best grades of leaf tobacco, the center of the cigar box industry is not located there but in the Pittsburgh region where the manufacture of stogies and cigars has gained a reputation.

Spanish cedar, it is claimed, gives a delicate odor to the cigars which is attributed to no other wood. This accounts for the fact that it is the principal cigar box wood not only in Pennsylvania but in the country at large. Spanish cedar is native to the West Indies and Central America and is brought to this country in log form to be manufactured. It is a broad leafed tree and not a relative of the domestic cedars or junipers which are conifers.
Not all of the Spanish cedar goes into cigar boxes as thin lumber. Much of it is veneer glued to a native wood that is thicker and this two-ply stock supplies a large part of the demand of the cigar box material and at a price considerably below that asked for Spanish cedar lumber. Yellow poplar, cotton gum, basswood, and red gum are the domestic woods which furnish most of the veneer backing. Yellow poplar is used in larger quantities in Pennsylvania than the combined amounts of the three other woods, probably because western Pennsylvania is near to the center of the yellow poplar lumber producing region. This region, together with a part of Pennsylvania, includes mainly West Virginia, eastern Kentucky, Tennessee, and southern Ohio. Tupelo or cotton gum and red gum are equally well suited for built-up material. They work easily and with the recent improvement in kiln drying veneer the objection formerly made to their tendency to twist and warp has been largely overcome. The decreasing supply of yellow poplar and its large demand for many other uses are bringing cotton and red gum rapidly to the front for this line of manufacture.

The domestic woods used are not all overlaid with Spanish cedar veneer. They are extensively cut to full thickness for boxes of solid lumber. To give these woods a cigar box appearance, which means to make it resemble Spanish cedar, the process of stamping is resorted to and improvements in this line give it an effect which makes it difficult without close inspection to distinguish the imitations from the cedar. Where domestic woods are independently used, most often the inside of the box is covered with litho paper, advertising the name of the cigar and maker. Waste in cigar box manufacture is largely utilized; the ends and sides can be made from what is left after cutting the tops and bottoms.

Table 61.—Wood for Cigar Boxes, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Spanish cedar</td>
<td>5,800,160</td>
<td>58.41</td>
<td>$112.71</td>
</tr>
<tr>
<td>Cotton gum</td>
<td>2,043,917</td>
<td>20.58</td>
<td>63.37</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>1,041,928</td>
<td>10.49</td>
<td>75.31</td>
</tr>
<tr>
<td>Red gum</td>
<td>9,930,155</td>
<td>85.44</td>
<td>49.79</td>
</tr>
<tr>
<td>Basswood</td>
<td>459,760</td>
<td>4.98</td>
<td>64.95</td>
</tr>
<tr>
<td>Total</td>
<td>9,930,755</td>
<td>100.00</td>
<td>$22.77</td>
</tr>
</tbody>
</table>

WOODENWARE AND NOVELTIES.

The commodities produced by the factories grouped under this industry are many and varied. This accounts for the twenty different woods listed in Table 62, including small quantities of two foreign woods, rosewood and lignum-vitae. The total consumption of wood in this industry was over eight and one-half million feet annually and beech, mostly home-grown, was used in quantities greater than the total of any other five woods listed. Basswood represented the greatest amount of shipped-in material, a little over three-fourths of it coming from New York and West Virginia.
Woodenware refers to useful household articles, such as pails, buckets, freezers, hose reels, snow shovels, rat and mouse traps, comb boxes, broom holders, and towel racks, and also to utensils important in the equipment of kitchens, such as pastry and pie boards, meat boards, rolling pins, saw cutters, fish and steak planks, lemon squeezer, potato mashers, etc. A portion of the pails made by this industry in Pennsylvania is for candy packages. Though these may more properly belong to the box industry, they have been included here with other pails and buckets, the method of manufacture being identical and the same factories making both styles. While white pine is the favorite wood for pail staves in Pennsylvania, as it is in nearly all other states where this industry is important, a few of the softer hardwoods like basswood, yellow poplar, buckeye, and willow are also employed. Bales or handles of buckets are rarely made by the pail manufacturer. The variety wood-workers or manufacturers specializing in all kinds of turnings furnish them. Beech, birch, and maple are used in the largest quantities.

Mouse traps belong to this industry. They are made of beech, yellow poplar, red gum, sugar maple, and white elm in the order named, and over 1,500,000 feet of these woods are annually required for their making. Sugar maple and holly were used for rolling pins, the latter being shipped from Arkansas and being desired because of its density, toughness, whitish color, and its capacity to turn well. Beech being strong and not imparting a taste went for lemon squeezer except for the bowls which required a harder, denser wood. Lignum-vitae, sent in from the West Indies, was found most suitable and is used for expensive squeezer while glass bowls answered for cheaper ones.

Planks for cooking planked fish and steaks have been made for years from one wood, principally white oak. Originally a common surfaced oak board met the demand but now they are manufactured in various shapes and sizes to fit the holders into which they are placed for service. To keep the essences from running off the plank they are frequently grooved which adds also to their appearance when not in use. Rosewood was the only foreign wood reported for toddy sticks but sugar maple and beech are most commonly used.

Novelties are of so many different kinds that space here will not allow an attempt to name them. Novelty makers themselves can hardly list all the different articles they make because they produce specialties of all kinds, mostly to order, and usually have no standard lines. Those marked with an * in the legend of the accompanying illustration will give an idea of the class of commodities included as novelties.

Table 62.—Wood for Woodenware and Novelties, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Beech,</td>
<td>3,639,000</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>1,690,500</td>
</tr>
<tr>
<td>Rosewood,</td>
<td>344,500</td>
</tr>
<tr>
<td>Ash,</td>
<td>634,500</td>
</tr>
<tr>
<td>White elm,</td>
<td>500,000</td>
</tr>
</tbody>
</table>
Fig. 16.—Taper bins for provision store, just completed by a butcher manufacturer of Pittsburgh.
Fig. 17.—Drawing showing standard dimensions of a wrapping board.
Fig. I - Complete Flas.
1. Cope
2. Nowel
3. Bottom board
4. Cope bars
5. Handles

Fig. II - Cope bars
4. Cope bars
5. Handles

Fig. III - Bottom board
3. Bottom board

Fig. IV - Foundry Flasks
Fig. 19.—Sixty different kinds of novelties made by one manufacturer of Pennsylvania.
DESCRIPTION OF FIGURE 19.

1. Plumber's turnpin—dogwood.
2. File handle—black walnut.
4. Drift plug (plumber's)—dogwood.
5. Banner pole emblem—yellow poplar.
7. Turned handles, bench tools—sugar maple.
8. Rolling pin—sugar maple.
10. Rough square—sugar maple.
11. Ten pin, made from 10.
12. Duck pin, made from 12.
13. Ten pin, made from 14 (rough square)—yellow poplar.
14. Ten pin, made from 14 (rough square)—yellow poplar.
15. Indian club made from 14 (rough square)—yellow poplar.
17. Tinner's mallet—lignum-vitae.
18. Carpenter's mallet—dogwood, maple handle.
19. Dental mallet—dogwood.
20. Flag pole top—sugar maple.
21. Foundry mallet—dogwood, maple handle.
22. Spoons—soft maple.
23. Baseboard, mounting used by taxidermist—red oak.
24. Watch case frame—yellow poplar.
27. Air pump handle—hickory.
28. Large and small plumber's dressers—lignum-vitae.
30. Spigots—red cedar.
31. Spigot, oil barrels—red cedar, two unfinished parts.
32. Fid (rope slicer)—hickory.
33. Large and small plumber's dressers—lignum-vitae.
34. Bottle corker—sugar maple.
35. Lemon squeezer—sugar maple with cup and filler—lignum vitae.
37. Ten pin ball made from 42.
38. Bull's eye used as a rope tie on ships—lignum vitae.
40. Gavel—ebony.
41. Alma plate—black walnut.
42. Cooper's mallet—dogwood and water gum, hickory handle.
43. Bolt—water gum.
44. Maul—hickory, handle made from 57.
45. Maul—hickory, handle made from 62.
46. Maul—hickory, handle with bark made from 62.
47. Kraut stamper—sugar maple, handle made from 70.
49. Pedestal for loving cup—red gum.
50. Candlestick—mahogany.
Table 62—Concluded.

<table>
<thead>
<tr>
<th>Kind of Wood.</th>
<th>Quantity.</th>
<th>Per cent.</th>
<th>Average cost.</th>
<th>Total cost.</th>
<th>Grown in Pennsyl-</th>
<th>Grown Out of Penn-</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td>per 1,000 ft.</td>
<td>per 1,000 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>482,500</td>
<td>5.63</td>
<td>29.31</td>
<td>14,045</td>
<td>27,500</td>
<td>455,000</td>
</tr>
<tr>
<td>Birch</td>
<td>466,500</td>
<td>5.44</td>
<td>28.95</td>
<td>13,505</td>
<td>230,000</td>
<td>230,000</td>
</tr>
<tr>
<td>Red gum,</td>
<td>225,000</td>
<td>2.62</td>
<td>23.59</td>
<td>5,250</td>
<td>225,000</td>
<td></td>
</tr>
<tr>
<td>White pine,</td>
<td>235,000</td>
<td>2.45</td>
<td>11.75</td>
<td>2,650</td>
<td>225,000</td>
<td></td>
</tr>
<tr>
<td>Red and silver maple</td>
<td>210,525</td>
<td>2.45</td>
<td>14.50</td>
<td>3,000</td>
<td>210,025</td>
<td></td>
</tr>
<tr>
<td>Yellow buckeye</td>
<td>63,700</td>
<td>0.8</td>
<td>25.00</td>
<td>2,000</td>
<td>83,700</td>
<td></td>
</tr>
<tr>
<td>Holly (American)</td>
<td>60,000</td>
<td>0.79</td>
<td>100.00</td>
<td>6,000</td>
<td>60,000</td>
<td></td>
</tr>
<tr>
<td>White oak</td>
<td>26,300</td>
<td>0.31</td>
<td>31.64</td>
<td>822</td>
<td>25,500</td>
<td>500</td>
</tr>
<tr>
<td>Willow</td>
<td>26,500</td>
<td>0.29</td>
<td>24.00</td>
<td>325</td>
<td>25,000</td>
<td>500</td>
</tr>
<tr>
<td>Cotton gum</td>
<td>8,500</td>
<td>0.08</td>
<td>20.00</td>
<td>130</td>
<td>6,500</td>
<td>500</td>
</tr>
<tr>
<td>Hickory</td>
<td>2,500</td>
<td>0.04</td>
<td>60.00</td>
<td>150</td>
<td>2,500</td>
<td></td>
</tr>
<tr>
<td>Spruce</td>
<td>1,000</td>
<td>0.01</td>
<td>43.00</td>
<td>43</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Red oak</td>
<td>800</td>
<td>0.01</td>
<td>40.00</td>
<td>42</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>Rosewood</td>
<td>555</td>
<td>0.01</td>
<td>24.00</td>
<td>130</td>
<td>555</td>
<td></td>
</tr>
<tr>
<td>Lignum-vitae</td>
<td>500</td>
<td>0.01</td>
<td>25.00</td>
<td>175</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8,574,789</strong></td>
<td><strong>100.00</strong></td>
<td><strong>29.57</strong></td>
<td><strong>$282,141</strong></td>
<td><strong>5,328,625</strong></td>
<td><strong>3,246,155</strong></td>
</tr>
</tbody>
</table>

TANKS, VATS, AND SILOS.

The market for wooden tanks is broadening in spite of the fact that metal tanks are used to a considerable extent. In no other line is there a greater increase in demand for this commodity than by factories where tanks are needed to furnish water for manufacturing and engineering purposes. They are usually elevated to the top of the factory buildings, but most frequently on towers varying in height according to the pressure desired. Water tanks along railroads are in this class and southern white cedar, cypress, white pine, and longleaf pine, in the order of quantity, are the woods used for the staves. Shortleaf pine and hemlock went for tank covers. Tank staves are made of heavy material, the thickness varying according to the size and use of the tanks. Often the staves are as much as three inches thick and they must of necessity be made of the best grade of lumber since tanks are subject to strong pressure besides continued atmospheric changes, and the influence of water and other liquids has a deteriorating effect.

In selecting material for tank and vat staves the manufacturer is guided mainly by the use to which the finished commodity is to be put, as there are qualities in the several woods which commend them for certain kinds. The distillers and vinegar makers prefer yellow poplar for keeping-vats, but yellow poplar in some localities is too costly and its place has been taken by cypress and white pine. Brewery vats are usually of cypress and white oak. These woods are durable and strong and have no effects upon the taste and odor of the contents. Where a tank is closed and fermentation active or where one of extra resisting power is needed, white oak is preferred because close grained, heavy, and strong. Southern white cedar is also a favorite and though not so strong as white oak, when used it is strongly reinforced.

Vats for the manufacture of oleomargarine are of white pine, cypress, and Douglas fir, while those in pickle factories are generally cypress, Douglas fir, and longleaf pine. Individual oil tanks call for white pine, white oak,
and chestnut. The use of the last named wood is interesting since Pennsylvania is the only state in which this wood has been reported for tank staves. It may be in the future that it will be called on more generally for this use owing to its being cheaper than most other tank woods and being sufficiently strong and durable. The tanners are not particular as to the kinds of woods used for their tanks, durability and strength being the principal considerations. Cypress and southern white cedar were the most prominent, the latter because of durability being the best qualified.

The silo is given a place in this industry because generally it resembles a tank both when built and in its component parts and occasionally makers of tank stock also manufacture silos. The processes of manufacture of both, though not identical, are similar. The up-to-date farmer regards the silo as an almost indispensable part of his equipment as it furnishes a means of having succulent forage during the winter season. The demand for silos is growing rapidly and large quantities of high grade lumber go for their making. Longleaf pine, Douglas fir, cypress, red or Norway pine, and white pine are the silo woods the Pennsylvania manufacturers report. White pine is probably the best known, as it has been used longer than any other and is the only home grown pine reported. Its high price probably accounts for its use only in small quantities. Because cypress is durable in damp situations, it is regarded one of the best silo materials and in some localities is preferred even above white pine. Next to southern white cedar it will outlast any other wood for silos. Longleaf pine from the South and Douglas fir from Idaho and Oregon are extensively used and are favored because staves can be made from them in sufficient lengths for one piece staves. Silos of this character are more easily erected than when the staves are in two or three pieces. These woods do not twist or warp; they are close-grained, strong, unaffected by acids or juices of the plants and are cheaper. Redwood is meeting a growing demand for staves according to silo makers in other states but none was used in Pennsylvania. It is claimed that redwood, next to cypress, is the most durable wood, can be gotten in long lengths, is free from sap and knots, is not given to check and warp, and will answer both for silos in exposed situations as well as for those built into barns.

Table 63.—Wood for Tanks and Silos, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Longleaf pine</td>
<td>2,565,000</td>
<td>32.66</td>
<td>$26.57</td>
<td>$68,150</td>
</tr>
<tr>
<td>Southern white cedar</td>
<td>2,554,000</td>
<td>32.52</td>
<td>36.33</td>
<td>92,740</td>
</tr>
<tr>
<td>Cypress (Said)</td>
<td>1,138,000</td>
<td>14.48</td>
<td>65.52</td>
<td>43,500</td>
</tr>
<tr>
<td>White pine, Redwood</td>
<td>820,000</td>
<td>10.44</td>
<td>34.84</td>
<td>25,570</td>
</tr>
<tr>
<td></td>
<td>450,000</td>
<td>5.75</td>
<td>42.33</td>
<td>18,500</td>
</tr>
<tr>
<td>Spruce</td>
<td>100,000</td>
<td>1.27</td>
<td>39.00</td>
<td>3,000</td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>86,000</td>
<td>1.16</td>
<td>29.47</td>
<td>2,540</td>
</tr>
<tr>
<td>White oak</td>
<td>50,000</td>
<td>.64</td>
<td>45.00</td>
<td>2,150</td>
</tr>
<tr>
<td>Norway pine</td>
<td>50,000</td>
<td>.64</td>
<td>35.00</td>
<td>1,750</td>
</tr>
<tr>
<td>Hemlock</td>
<td>25,000</td>
<td>.82</td>
<td>15.00</td>
<td>420</td>
</tr>
<tr>
<td>Chestnut</td>
<td>15,000</td>
<td>.19</td>
<td>20.00</td>
<td>300</td>
</tr>
<tr>
<td>Total</td>
<td>7,823,200</td>
<td>100.00</td>
<td>$56.67</td>
<td>$292,240</td>
</tr>
</tbody>
</table>
MACHINE CONSTRUCTION.

Most parts of the machinery equipment of paper mills, flour mills, ice factories, sawmills, cotton gins, etc., are made of iron and steel, but for others wood is required and it is the different kinds of lumber for making these parts that are listed in Table 64. Electrical machinery parts and other electrical apparatus are not included in this class. This information will be presented subsequently as a separate industry. It is natural to infer that wooden parts of machinery must, in a great number of cases, call for lumber of great strength. It is not surprising, therefore, to find that white oak is the preponderant wood, comprising over one-third of the total and that long-leaf pine and hickory follow it in quantity. The largest amount of hickory in the form of plank is shown in this industry. The vehicle and handle makers report using more but their raw material is in billet form, in squares, and in bolts. Douglas fir is the only Pacific coast wood listed. Like long-leaf pine it possesses considerable strength and because the trees grow large and of great height, timber of large dimensions and length can readily be obtained. This probably accounts for its appearance in this industry, far from where it is cut. The average price is nearly twice that of longleaf pine.

Machine parts must necessarily be made from high grade lumber and in this connection it is interesting to note that nearly 55 per cent. of all that was reported was grown in the State. The factories included in this industry are numerous, though compared with other industries they use small amounts of wood. The fact that the requirements of these manufacturers are met so largely by the forests of the State should elicit their interest in the movement to protect forests and thereby perpetuate the State's timber supply. Some parts of 14 of the 19 woods listed in the table were cut in Pennsylvania, and their principal uses have been arranged in the order of their importance as follows:

Bins (Road Equipment).

- Shortleaf pine.
- Yellow poplar.

Breaker.

- Yellow poplar.

Cider Mills.

- Yellow poplar.

Clay Working Machinery.

- Hemlock.

Cranes.

- Yellow poplar.

Coal Mining Machinery.

- White oak.
- Hickory.
- White ash.
- Shortleaf pine.
- Maple.
- Birch.
- Basswood.
- Yellow poplar.
- Chestnut.
- Hemlock.

Derricks.

- White oak.
- Cork elm.
- Sugar maple.
- Douglas fir.

Elevators.

- Red oak.
- Chestnut.
- Longleaf pine.
- Yellow poplar, (feed mills).
- Basswood.
- White oak.

Engine and Machinery Skids.

- Beech.
- Sugar maple.
- Hemlock.
- Hickory.

Flour and Feed Mill Machinery.

- Red oak.
- Yellow poplar.
- Longleaf pine.
- Sugar maple.
- Hickory.
- Chestnut.
- White ash.
- White pine.

General Mill Machinery.

- White pine.
- Longleaf pine.
- Sugar maple.
- White oak.
- Cypress.
Hoists.
Yellow poplar.
Sugar maple.
Hickory.

Horse Power Machinery.
Sugar maple.
Yellow poplar.

Ice Machines.
White oak.
Red oak.
Longleaf pine.
White ash.

Oil Well Machinery.
White oak.
Red oak.
White pine.
Shortleaf pine.
Hemlock.
Sugar maple.
Beech.
Douglas fir.
Longleaf pine.

Ore Machinery.
Red oak.
Chestnut.

Paper Mill Machinery.
White oak.
Yellow poplar.
Longleaf pine.
Sugar maple.

Push Poles.
Hickory.
Ash.

Road Scrapers.
Longleaf pine.
White pine.

Road Engine Parts.
Yellow poplar.
Red oak.
White oak.
White pine.

Rock and Stone Crushers.
Red oak.
Chestnut.
White oak.
White pine.

Sawmill Parts.
Longleaf pine.
Hickory.
Red oak.
White oak.
Shortleaf pine.

Mining Screens.
Red oak.
Chestnut.

Water Wheels.
White oak.
White pine.
Shortleaf pine.
Poplar.

Table 64.—Wood for Machine Construction Parts, year ending June, 1912.

| Kind of Wood       | Quantity |  |  |  |
|--------------------|----------|------------------------------------------------------------------------------------------------|
|                    | Feet b. m. | Per cent. | Average cost per 1,000 ft. | Total cost $ b. h. factory | Grown in Pennsylvan ia | Grown Out of Pennsylvania |
| White oak,         | 2,366,100  | 33.61     | $36.31  | $2,558                 | 2,311,100               | 55,000                   |
| Longleaf pine,     | 1,311,000  | 20.33     | $27.66  | 35,565                 | 1,431,000               | 56,000                   |
| Hickory,           | 299,600   | 4.55      | $23.27  | 19,063                 | 648,000                 | 145,700                  |
| Sugar maple,       | 610,500   | 9.30      | $43.86  | 27,483                 | 611,000                 | 611,000                  |
| Red oak,           | 557,500   | 8.22      | $27.73  | 16,401                 | 247,500                 | 247,500                  |
| Hemlock,           | 286,600   | 4.29      | $18.32  | 286,500                | 286,500                 | 286,500                  |
| Douglas fir,       | 288,500   | 4.10      | $29.69  | 8,572                  | 145,700                 | 145,700                  |
| Shortleaf pine,    | 300,600   | 4.55      | $31.25  | 16,350                 | 209,000                 | 209,000                  |
| White pine,        | 163,000   | 2.51      | $28.89  | 16,900                 | 183,000                 | 183,000                  |
|                        | 145,500   | 2.24      | $41.34  | 5,632                  | 83,500                  | 83,500                   |
| Ash                 | 53,000    | 0.81      | $44.88  | 5,725                  | 5,725                   | 79,000                   |
| Chestnut,          | 73,003    | 1.14      | $35.67  | 2,501                  | 22,600                  | 22,600                   |
| Pitch pine,        | 49,100    | 0.76      | $16.44  | 867                    | 49,100                  | 49,100                   |
| Lobolly pine,      | 25,000    | 0.39      | $32.66  | 800                    | 25,000                  | 25,000                   |
| Beech              | 11,000    | 0.16      | $14.25  | 100                    | 11,000                  | 11,000                   |
Table 64—Concluded.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Per cent</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td></td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Basswood</td>
<td>8,500</td>
<td>.12</td>
<td>26.47</td>
<td>210</td>
<td>500</td>
<td>8,000</td>
</tr>
<tr>
<td>Birch</td>
<td>3,000</td>
<td>.04</td>
<td>26.00</td>
<td>75</td>
<td>3,000</td>
<td></td>
</tr>
<tr>
<td>Cork elm</td>
<td>2,000</td>
<td>.02</td>
<td>30.00</td>
<td>100</td>
<td></td>
<td>2,000</td>
</tr>
<tr>
<td>Cypress (bald)</td>
<td>150</td>
<td></td>
<td>75.00</td>
<td>11</td>
<td></td>
<td>150</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7,040,350</td>
<td>100.00</td>
<td>$39.22</td>
<td>$306,508</td>
<td>3,858,200</td>
<td>3,182,150</td>
</tr>
</tbody>
</table>

*Less than 1-100 of 1 per cent.

AGRICULTURAL IMPLEMENTS.

All commodities used by farmers in the preparation of the soil and in gathering and garnering crops are grouped under this industry. The principal uses of the eighteen woods called for are as follows:

- **Cider Mill Presses.**
  - Sugar maple.
  - White pine.

- **Cultivator Parts.**
  - Ash (handles, pole).
  - Shortleaf pine.
  - White oak (handles).

- **Corn Planter Parts.**
  - Basswood.
  - Yellow poplar.

- **Corn Sheller Parts.**
  - Beech (frames).
  - Birch (frames).
  - Chestnut.
  - Shortleaf pine (sides).
  - Sugar maple (boxes, posts).

- **Eveners.**
  - Hickory.
  - Red oak.
  - White oak.

- **Feed and Ensilage Cutter Parts.**
  - Beech (frame work).
  - Cypress (boxes).
  - Shortleaf pine (box sides).
  - Yellow poplar (sides).

- **Fertilizer and Lime Distributors.**
  - Cotton gum (boxes).
  - Longleaf pine (poles).
  - Red gum.

- **Hand Rakes.**
  - Hickory (teeth).

- **Harrors, Spike Tooth.**
  - Red oak.
  - White oak.

- **Hay Ladders.**
  - Ash.
  - White oak.

- **Hay Presses.**
  - Sugar maple.
  - White oak.

- **Horse Pokes.**
  - White elm.

- **Horse Rake Parts.**
  - White ash.

- **Land Roller Parts.**
  - Longleaf pine (poles, tops).
  - Shortleaf pine (tops).
  - Sugar maple (blocks, tongues, tops).
  - White oak (frames).

- **Lawn Mower Handles.**
  - Black ash.
  - White ash.

- **Levers, Various Implements.**
  - White ash.

- **Fertilizer Distributor Parts.**
  - Red gum.
Litter and Straw Carrier Parts. Neck Yokes.

Sugar maple. Hickory.
White oak. White oak.
Yellow poplar. Beech.

Threshing machines, including grain threshers and clover hullers, are the most important commodities of this industry, and in this particular line of manufacture Pennsylvania leads all other states. There are many interior parts of these machines that require woods of different qualities. The general tendency to substitute metal for wood has not proved practical and consequently a majority of these parts like grain registers, dust conveyors, and screen frames are still made largely of wood. Likely for the same reason, frames and siding or exterior panels of threshers call for wood and white pine and yellow poplar are the principal panel woods because these woods are light, easily worked, take paint readily, and are not given to twist and check.

Straw-carriers, closely allied to threshers, are another product important in this industry in Pennsylvania. Woods similar to those for threshers are demanded; white oak, yellow poplar, and sugar maple in the order named being most frequently called for.

Corn shellers and land rollers demand a considerable amount of lumber each year. Beech for framing, shortleaf pine, and yellow poplar for panels play an important part in making the former, and sugar maple and oak for the latter. The rollers of land rollers were formerly made of wood. A cross-section from a sycamore or yellow poplar log was usually selected and the rollers were usually made on the farm or at nearby blacksmith shops. Today these implements are in universal use and have been found indispensable, as a labor saver. The factories sometime ago began making them and now use metal almost entirely, but a small amount of wood is still in use and hard maple meets the demand in the State. The bottoms of the roller platforms are of shortleaf pine but any strong wood will answer for this purpose. The roller blocks or bearing frames are of hard maple. The hay baler manufacturers also use sugar maple ahead of other woods; but oak, both white and red, is indispensable for certain parts.

Table 65.—Wood for Agricultural Implements, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft. at factory.</td>
</tr>
<tr>
<td>White oak,</td>
<td>1,878,700</td>
<td>22.97</td>
<td>$85.60</td>
</tr>
<tr>
<td>Red oak,</td>
<td>1,187,000</td>
<td>14.74</td>
<td>38.80</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>1,021,900</td>
<td>13.14</td>
<td>45.61</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>777,900</td>
<td>10.15</td>
<td>34.90</td>
</tr>
<tr>
<td>Ash,</td>
<td>536,100</td>
<td>7.14</td>
<td>38.73</td>
</tr>
<tr>
<td>Longleaf pine</td>
<td>563,300</td>
<td>7.51</td>
<td>31.77</td>
</tr>
<tr>
<td>Chestnut,</td>
<td>169,000</td>
<td>2.26</td>
<td>19.07</td>
</tr>
<tr>
<td>Hickory,</td>
<td>134,000</td>
<td>1.78</td>
<td>39.41</td>
</tr>
<tr>
<td>White pine,</td>
<td>116,000</td>
<td>1.65</td>
<td>31.71</td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>55,000</td>
<td>1.49</td>
<td>39.74</td>
</tr>
</tbody>
</table>
Table 65—Concluded.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
<td>Total cost f. o. b. factory.</td>
</tr>
<tr>
<td>Basswood,</td>
<td>30,000</td>
<td>1.14</td>
<td>21.60</td>
<td>2,485</td>
</tr>
<tr>
<td>Cork elm,</td>
<td>50,000</td>
<td>.71</td>
<td>23.60</td>
<td>1,250</td>
</tr>
<tr>
<td>Beech,</td>
<td>47,000</td>
<td>.60</td>
<td>22.80</td>
<td>970</td>
</tr>
<tr>
<td>Cotton gum,</td>
<td>37,000</td>
<td>.50</td>
<td>26.00</td>
<td>1,450</td>
</tr>
<tr>
<td>Cypress (Bald),</td>
<td>30,000</td>
<td>.43</td>
<td>25.00</td>
<td>1,050</td>
</tr>
<tr>
<td>Red gum,</td>
<td>22,000</td>
<td>.34</td>
<td>26.00</td>
<td>884</td>
</tr>
<tr>
<td>Birch,</td>
<td>26,000</td>
<td>.33</td>
<td>24.00</td>
<td>689</td>
</tr>
<tr>
<td>Cucumber,</td>
<td>300</td>
<td>.01</td>
<td>30.00</td>
<td>9</td>
</tr>
<tr>
<td>Total,</td>
<td>7,004,300</td>
<td>100.00</td>
<td>$328.89</td>
<td>$230,387</td>
</tr>
</tbody>
</table>

*Less than 1/100 of 1 per cent.

TOYS.

The commodities included in this industry and the woods that supplied the material for making them are as follows:

**Animals.**
- Basswood.

**Blocks (Toy Wagon).**
- White pine.

**Boats.**
- Basswood.
- White pine.

**Cannon and Fort Sets.**
- Basswood.
- Sweet birch.
- Beech.

**Chairs (Children's).**
- Hard maple.
- Beech.

**Chairs.**
- Birch.

**Circus Sets.**
- Basswood.
- White pine.
- Yellow poplar.
- Sweet birch.
- Beech.

**Dolls.**
- Basswood.

**Furniture.**
- White pine.
- Beech.
- Yellow poplar.

- Chestnut.
- Birch.
- Soft maple.
- Sugar maple.
- White oak.
- Red oak.
- Elm.

**Games.**
- White ash.
- White oak.
- Yellow poplar.
- Basswood.

**Holders (Christmas Tree).**
- Yellow poplar.

**Jumpers (Swing).**
- Red gum.

**Pianos (Children's).**
- Basswood.

**Pastry Sets.**
- White elm.
- Red oak.
- White oak.

**Play Yards (Baby).**
- White oak.
- Red oak.

**Shooting Galleries.**
- White pine.
- Beech.
- Sweet birch.
- Basswood.
Basswood is the principal material for wooden toys and for the wooden parts of metal toys. It is not only demanded in the greatest amount but it enters into the manufacture of more kinds than any other species. It alone supplied the material for the all-wood doll which is made in no other state. This doll is unique, ingenious, and wonderfully useful, in that nearly all parts,—body, arms, legs, hands, feet,—even the head—are made of solid wood. The face is artistically carved and when enameled in lifelike colors and the doll dressed, it is difficult to tell that it is made of wood. The parts of the body are jointed with steel bands having swivel connection, which gives flexibility and freedom of movement. The all-wood doll is made with facial characteristics representative of different nations and of comical characters.

The making of toy pianos is another important division of this industry. Basswood is the prevailing wood again and it goes into all the various parts except the base of large size pianos where a stronger wood is needed, and ash and oak meet this demand. Because it is easily bored and turned to shape, this wood answers first for toy cannons. It is also principally used for wooden animals in menageries and for horse heads and bodies for stick horses.

Though Pennsylvania was sixth in the list of states in the production of basswood lumber, the toy manufacturers reported purchasing 60 per cent. of their requirements from other states. Sugar maple, white pine, and yellow poplar were used not only in almost equal amounts but the average price paid for these woods was also nearly equal. That so much yellow pop-
lar was State-grown is somewhat surprising. In no other industry of this report does wood, State-grown, equal so large a per cent of the total. Nearly six and a half million feet was required and of this over 85 per cent. is cut in Pennsylvania.

Table 66.—Wood for Toys, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity.</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft. at factory.</td>
<td>Total cost f. o. b. factory.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Basswood,</td>
<td>1,904,660</td>
<td>21.65</td>
<td>40.50</td>
<td>57,250</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>752,500</td>
<td>8.77</td>
<td>25.31</td>
<td>19,200</td>
</tr>
<tr>
<td>White pine,</td>
<td>700,000</td>
<td>8.00</td>
<td>24.90</td>
<td>18,600</td>
</tr>
<tr>
<td>Yellow poplar,</td>
<td>567,400</td>
<td>6.77</td>
<td>22.81</td>
<td>11,553</td>
</tr>
<tr>
<td>Beech,</td>
<td>377,000</td>
<td>4.35</td>
<td>20.90</td>
<td>10,980</td>
</tr>
<tr>
<td>Birch</td>
<td>277,000</td>
<td>3.17</td>
<td>19.75</td>
<td>7,875</td>
</tr>
<tr>
<td>Chestnut</td>
<td>175,000</td>
<td>2.00</td>
<td>18.00</td>
<td>10,600</td>
</tr>
<tr>
<td>Red and silver maple,</td>
<td>175,000</td>
<td>2.00</td>
<td>19.75</td>
<td>10,980</td>
</tr>
<tr>
<td>Ash</td>
<td>175,000</td>
<td>2.00</td>
<td>19.75</td>
<td>10,980</td>
</tr>
<tr>
<td>White oak</td>
<td>152,000</td>
<td>1.80</td>
<td>18.25</td>
<td>8,600</td>
</tr>
<tr>
<td>Red oak,</td>
<td>125,000</td>
<td>1.45</td>
<td>17.75</td>
<td>8,000</td>
</tr>
<tr>
<td>White elm</td>
<td>100,000</td>
<td>1.15</td>
<td>16.25</td>
<td>6,250</td>
</tr>
<tr>
<td>Cotton gum,</td>
<td>5,000</td>
<td>0.06</td>
<td>16.00</td>
<td>100</td>
</tr>
<tr>
<td>Red gum</td>
<td>5,000</td>
<td>0.06</td>
<td>16.00</td>
<td>100</td>
</tr>
<tr>
<td>Spence</td>
<td>1,300</td>
<td>0.02</td>
<td>13.50</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>6,121,500</td>
<td>100.00</td>
<td>23.87</td>
<td>182,193</td>
</tr>
</tbody>
</table>

TRUNKS AND VALISES.

Nine woods make up the four million feet of lumber required yearly in Pennsylvania for making trunks. A number of manufacturers do all the work from the arrival of the rough lumber to the covering, lining, and varnishing of the finished commodity, but others make only the rough boxes in the white, others slats, and others purchase the different parts already manufactured and merely put them together and finish them. The last named class of manufacturers did not make reports for this study because they do not operate wood-working machinery and are merely assemblers. The fact that white elm leads in quantity all other woods listed in the table indicates that in Pennsylvania the slat makers form the most important division of this industry. The quantity demanded, though fairly large, does not equal the amount of ash, which, next to elm, is generally the principal slat wood. Hickory is a frequently used slat wood on sample cases because of its strength but none of the trunk makers reported its use in Pennsylvania; its weight and its high price being against it.

Basswood is the favorite wood for trunk boxes and in Pennsylvania furnished about three-quarters of the material which the manufacturers used. It works easily and holds its shape. The fact that it is fairly strong for its weight qualifies it more than any other factor for this use. Cottonwood is its principal competitor and in the country at large is used in larger quantities. Like basswood it enters largely into veneer and then into built-up lumber from which the better grades of trunk boxes are largely made. Three and four-ply are the thicknesses principally used. Besides being of
lighter weight than ordinary solid trunk box material it is also more substantial and, therefore, in most cases, does not require slat reinforcement. The trunk maker does not buy veneer and make panels. He buys panels already glued together in various thicknesses according to his varied needs. Red gum appears in the table in only small quantities. In other states the demand for it for trunks seems to be increasing and, like cottonwood, is purchased mostly in the form of built-up lumber.

White pine is a favorite wood for trunks made of solid lumber. It is purchased surfaced two sides and edged in thicknesses ranging from $\frac{3}{8}$ inches to $\frac{3}{4}$ inches according to the size and purpose for which the trunk is designed. In quantity the Pennsylvania trunk makers demanded white pine next to basswood. In the country at large loblolly pine is probably called on for solid trunk boxes ahead of any other wood. Lumber from second growth trees is preferred because of the large proportion of sapwood, its freedom from pitch, its light color and light weight. It goes for making the cheaper grades. As little of the wood is visible in the finished product, being covered with leather, cloth, and metal, the figure or color of the wood is not essential.

To save weight, a light wood, cut as thin as the maximum stress will allow, is demanded for trays and inside compartments. Basswood met the largest part of the demand in Pennsylvania while in other states yellow poplar, cotton gum, buckeye, and cottonwood were the species principally employed.

Table 67.—Wood for Trunks and Valises, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft. at factory.</td>
<td>Total cost f. e. b. factory.</td>
</tr>
<tr>
<td>White elm</td>
<td>1,367,500</td>
<td>44.57</td>
<td>$20.82</td>
<td>$56,625</td>
</tr>
<tr>
<td>Basswood</td>
<td>1,204,500</td>
<td>39.24</td>
<td>27.69</td>
<td>28,200</td>
</tr>
<tr>
<td>White pine</td>
<td>428,000</td>
<td>16.29</td>
<td>38.09</td>
<td>12,255</td>
</tr>
<tr>
<td>Cottonwood</td>
<td>177,350</td>
<td>5.92</td>
<td>37.95</td>
<td>6,731</td>
</tr>
<tr>
<td>Loblolly pine</td>
<td>160,000</td>
<td>5.88</td>
<td>24.22</td>
<td>3,578</td>
</tr>
<tr>
<td>Ash</td>
<td>37,500</td>
<td>1.22</td>
<td>36.42</td>
<td>3,187</td>
</tr>
<tr>
<td>Chestnut</td>
<td>37,500</td>
<td>1.21</td>
<td>25.00</td>
<td>928</td>
</tr>
<tr>
<td>Red gum</td>
<td>20,000</td>
<td>0.63</td>
<td>35.09</td>
<td>700</td>
</tr>
<tr>
<td>Total</td>
<td>4,122,850</td>
<td>100.00</td>
<td>$25.72</td>
<td>$122,520</td>
</tr>
</tbody>
</table>

BRUSHES.

Pennsylvania surpasses all other states in the production of brush blocks and for their manufacture the factories consume over four million feet of wood annually. Of this material the forests of the state furnished over 93 per cent. of the total, a fact which should appeal to this class of manufacturers when giving consideration to the source of future supply of raw material and what measures are to be taken when the present timber stand is gone. Each kind of the almost multitudinous variety of brushes that are manufactured requires a block of special size and shape, and a wood pos-
Fig. 21.—Oil tank staves preparatory to assembling.

Fig. 22.—Finished oil tank.
Fig. 25.—Brush Blocks.

Fig. 26.—Brush Blocks.
sitting qualities adaptable to the special use of the brush. This accounts for the long list shown in the table. There are sixteen woods, and beech constitutes much the largest amount, being equal to almost half of the total. This wood is one of the most plentiful hardwoods growing in Pennsylvania, having properties admirably suited for cheap brushes, and is one of the factors making the industry important in the state. Maple furnishes material for brush blocks considerably more desirable than beech, and, therefore, is in demand for a better grade of brushes. It follows beech in importance as to quantity but of course is higher priced. In no other industry is cherry reported in so large amounts as for brushes. Its low average price as compared to that paid for the same wood by other classes of factories in the State is quite surprising. This industry does not include altogether the production of cheap brush blocks such as are used for making scrubbing, creamery, and brewery, sinks, dust pan, horse, feather dusters, window, stove, carpet, paint, whitewash, and frescoing brushes, and stable and street brooms, but it includes blocks for better grades requiring higher priced woods,—such as red cedar, ash, sycamore, holly, red oak, black walnut, rosewood, boxwood, and other foreign woods. The latter kinds are used for hair brushes, hat, jewelry, clothes, hand, nail, and flesh brushes. The absence of mahogany and ebony from the list of high grade brush woods is hard to explain but none of the manufacturers reported them in this State.

Table 68.—Wood for Brushes, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft. at factory</td>
</tr>
<tr>
<td>Beech</td>
<td>1,261,000</td>
<td>47.53</td>
<td>$38.57</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>1,062,500</td>
<td>38.45</td>
<td>$34.75</td>
</tr>
<tr>
<td>Cherry (black)</td>
<td>432,000</td>
<td>11.86</td>
<td>$50.40</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>187,000</td>
<td>6.98</td>
<td>$40.00</td>
</tr>
<tr>
<td>Red and silver maple</td>
<td>165,000</td>
<td>6.38</td>
<td>$18.66</td>
</tr>
<tr>
<td>Sycamore</td>
<td>71,000</td>
<td>1.76</td>
<td>$26.00</td>
</tr>
<tr>
<td>Birch</td>
<td>31,000</td>
<td>1.38</td>
<td>$14.92</td>
</tr>
<tr>
<td>Basswood</td>
<td>42,300</td>
<td>1.65</td>
<td>$34.96</td>
</tr>
<tr>
<td>Red gum</td>
<td>37,000</td>
<td>1.57</td>
<td>$57.90</td>
</tr>
<tr>
<td>Red cedar</td>
<td>23,000</td>
<td>0.92</td>
<td>$61.57</td>
</tr>
<tr>
<td>Ash</td>
<td>12,000</td>
<td>0.88</td>
<td>$34.80</td>
</tr>
<tr>
<td>Boxwood (West Indian)</td>
<td>3,400</td>
<td>0.13</td>
<td>$31.53</td>
</tr>
<tr>
<td>Holly (American)</td>
<td>1,000</td>
<td>0.04</td>
<td>$45.50</td>
</tr>
<tr>
<td>Black walnut</td>
<td>1,000</td>
<td>0.04</td>
<td>$59.90</td>
</tr>
<tr>
<td>Red oak</td>
<td>600</td>
<td>0.02</td>
<td>$79.00</td>
</tr>
<tr>
<td>Rosewood</td>
<td>250</td>
<td>0.01</td>
<td>$30.00</td>
</tr>
<tr>
<td>Total</td>
<td>14,067,000</td>
<td>100.00</td>
<td>$22.34</td>
</tr>
</tbody>
</table>

SHUTTLES, SPOOLS, AND BOBBINS.

The industry making bobbins, spools, shuttles and other loom appliances is in quantity not so large and important in Pennsylvania as in Maine, New York, and New Hampshire; but the fact that these commodities manufactured in Pennsylvania go almost entirely for use in silk mills, and only
a few for woollen and cotton mills, is quite significant. Sugar and soft maple furnished the bobbin and speeder material, and for quills sugar maple and dogwood met the demand, the latter to only a limited extent on account of its higher price. Bobbin material must be hard, tough, close grained, with a texture that smooths easily, and must not rough up in turning.

Paper birch is the species from which small thread spools are manufactured and Maine is the state where most of them are produced. Small spools are turned from a single piece of wood but no factories in Pennsylvania were found making them. The manufacture of large spools, the three-pieced product, used in loom weaving, called for a considerable quantity of lumber. The barrels, sometimes called middles, are made by a process similar to that used in making bobbins and speeders and when in the rough-turned form resemble them except the barrels are uniformly cylindrical. Sugar and soft maple supplied the material for their making in Pennsylvania, but in New England beech and the birches were also used. The heads of these spools, which are cut circular, were entirely of yellow poplar and are screwed on and glued to the barrel, which is threaded at each end.

The most exacting demand for both dogwood and persimmon is for shuttle manufacture. These woods possess a hard dense fiber, wear smooth by use, do not rough up, and besides are heavy and strong. They are the favorite domestic woods for this purpose. Shuttles for silk weaving are made to only a limited extent of these woods. Foreign woods are also called on. Boxwood, both the kind that comes from the Caspian Sea countries and that shipped from the West Indies, was reported, and also small amounts of sarbo and doncella. They are the highest priced woods that are shown in the table. Formerly boxwood furnished nearly all the shuttle material but when its price became prohibitive dogwood took its place and proved a practical and satisfactory substitute. Persimmon has in comparatively recent years become prominent for shuttles, chiefly owing to the insufficient supply of dogwood to meet the entire demand. Shuttles are made from squares cut to the desired size called shuttle blocks and it is in this form that the manufacturers in Pennsylvania purchase their raw material. From the rough block to the finished shuttle there are twenty-two distinct operations.

White oak appears in this industry for making picker sticks and in no other state in which this article was reported was this wood used to any considerable extent. Hickory is the principal picker stick material and in Pennsylvania it supplied almost two-thirds of all wood demanded for this use. Quill boards are made entirely of yellow poplar and loom frames of sugar maple.

Table 69.—Shuttles, Spools, and Bobbins, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>2,282,000</td>
<td>75.51</td>
<td>$24.85</td>
</tr>
<tr>
<td>Red and silver maple</td>
<td>375,000</td>
<td>11.20</td>
<td>36.43</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>324,000</td>
<td>9.59</td>
<td>36.59</td>
</tr>
<tr>
<td>Hickory</td>
<td>62,000</td>
<td>1.88</td>
<td>46.98</td>
</tr>
<tr>
<td>White oak</td>
<td>35,000</td>
<td>1.05</td>
<td>50.00</td>
</tr>
</tbody>
</table>
Fig. 28. Piano cases and kinds of wood used in their manufacture.
DESCRIPTION OF FIGURE 28.

UPRIGHT PIANO.

Figure I.

1. Top panel, 1. Pin blocks: Sugar Maple.
9. Pilaster, 9. Moulding, fall boards, pilasters, and key blocks, are always veneered, the veneer being of a fine-finish wood such as mahogany, birds-eye maple, black and Circassian walnut, and rosewood, and from one to three-ply in thickness on a core of some good body wood such as sound wormy chestnut, red oak, yellow poplar, and white pine.
17. Fall board.
Fig. 29. Action parts of upright piano.

A—Damper felt.
B—Damper head lining felt.
C—Brushing cloth.
D—Action cloth.
E—Action leather.
F—Catcher felt.
G—Hammer top felt.
H—Hammer under felt.
J—Butt felt.
K—Regulating punchings.
L—Hammer rail cloth.
M—Jack check felt.
N—Spring rail felt.
O—Damper lever felt.
Z—Action cloth.

No.
5—Action screw.
29—Regulating button (Sugar Maple).
41—Action screw.
42—Center pins.
100—Lower flange rail (Sugar Maple).
101—Hammer moulding (Sugar Maple, Red Cedar, Mahogany).
102—Hammer rail (Sugar Maple, Mahogany, Birch).
103—Hammer shanks (Sugar Maple, Red Cedar).
104—Hammer butt (Sugar Maple).
105—Back stop (Sugar Maple).
125—Regulating rail bracket.
Table 69—Concluded.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost for b. h. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Dogwood</td>
<td>17,585</td>
<td>.52</td>
<td>69 60</td>
<td>1,224</td>
<td>...</td>
</tr>
<tr>
<td>Persimmon, Dogwood, Doncella,</td>
<td>7,010</td>
<td>.21</td>
<td>69 60</td>
<td>421</td>
<td>...</td>
</tr>
<tr>
<td>Sarbo</td>
<td>1,369</td>
<td>.64</td>
<td>82 96</td>
<td>85</td>
<td>6</td>
</tr>
<tr>
<td>Plum</td>
<td>30</td>
<td>*</td>
<td>200 60</td>
<td>6</td>
<td>...</td>
</tr>
<tr>
<td>Doncella</td>
<td>10</td>
<td>*</td>
<td>100 00</td>
<td>1</td>
<td>...</td>
</tr>
<tr>
<td>Total</td>
<td>3,247,985</td>
<td>100.60</td>
<td>$27 14</td>
<td>$98,888</td>
<td>1,570,000</td>
</tr>
</tbody>
</table>

*Less than 1/100 of 1 per cent.

DAIRYMEN’S AND POULTERERS’ SUPPLIES.

The new methods in vogue for carrying on the dairy and creamery as well as the poultry business along scientific lines has brought about the use and manufacture of special equipment among which are included important articles made of wood. The factories manufacturing these articles are the ones that have supplied the data which has been compiled in the table following. They are in no way related and have been combined only for convenience in presenting the statistics since it is considered in this way the uses of the various woods may be more readily discussed. No one factory was found making the entire equipment for all of these above lines of business. They usually specialize either in one particular line or in the manufacture of a single commodity as incubators, butter tubs, egg crates, etc.

Under dairymen’s supplies for Pennsylvania are grouped the making of churns, butter tubs, cheese boxes, churn vats, milk bottle washers, and curd grinders. Ash is the principal wood for churns, both for the staves and for the paddles because it retains its shape and is less liable than any other wood to impart taste. This wood is used for making all kinds from the small domestic churns propelled by hand to the large cylindrical churn used in creameries. For the same reason that ash is used for churns it is called for ahead of any other wood for making butter tubs and butter pails. Maple is used with it for bottoms and covers of butter tubs but the quantity is relatively small. In some states experiments have been made with cypress for butter tubs but it was not in use in Pennsylvania although it was reported with ash for churn vats. Over a million and a half feet of wood is required for making cheese boxes. Because white elm has the property of bending it is used for these commodities ahead of any other wood, not only in Pennsylvania, but elsewhere. Other woods are used in fairly large amounts probably more for the reason that they could be purchased cheaper than for any special adaptability. These woods include beech, yellow birch, oak, hemlock, and ash. Wooden parts of the curd grinding machines in cheese factories account for the appearance in the table of cottonwood, ironwood, and a large part of the sugar maple.

The manufacturers of poulterers’ supplies required almost as much lumber as the factories making dairymen’s equipment. Incubators and brooders were the commodities manufactured. Cypress in the largest amounts answered
with yellow poplar and white pine for incubator cases and also for trays and other inside work. Its stability, affinity for paint and durability are the qualities desired for these uses. The bases and legs of incubators are of red oak and sugar maple, probably selected for strength. Brooder case woods are the same as for incubators except red oak instead of cypress went for frames.

Table 70.—Wood for Dairymen’s, Poulterers’, and Apiarists’ Supplies, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>White elm,</td>
<td>600,000</td>
<td>18.51</td>
<td>$25.00</td>
</tr>
<tr>
<td>Cypress (bald),</td>
<td>545,000</td>
<td>16.82</td>
<td>37.02</td>
</tr>
<tr>
<td>Ash,</td>
<td>400,000</td>
<td>12.24</td>
<td>15.60</td>
</tr>
<tr>
<td>Basswood,</td>
<td>320,000</td>
<td>4.52</td>
<td>18.00</td>
</tr>
<tr>
<td>Yellow poplar,</td>
<td>220,000</td>
<td>3.75</td>
<td>28.82</td>
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<tr>
<td>Hemlock,</td>
<td>315,000</td>
<td>9.63</td>
<td>15.48</td>
</tr>
<tr>
<td>White oak,</td>
<td>305,000</td>
<td>9.33</td>
<td>18.96</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>152,500</td>
<td>4.73</td>
<td>27.86</td>
</tr>
<tr>
<td>Shortleaf pine,</td>
<td>145,900</td>
<td>4.45</td>
<td>15.82</td>
</tr>
<tr>
<td>Beech,</td>
<td>100,000</td>
<td>3.05</td>
<td>16.00</td>
</tr>
<tr>
<td>Birch,</td>
<td>100,000</td>
<td>3.05</td>
<td>18.00</td>
</tr>
<tr>
<td>White pine,</td>
<td>75,000</td>
<td>2.44</td>
<td>22.58</td>
</tr>
<tr>
<td>Red cedar,</td>
<td>45,000</td>
<td>1.29</td>
<td>23.00</td>
</tr>
<tr>
<td>Red oak,</td>
<td>36,000</td>
<td>1.11</td>
<td>23.00</td>
</tr>
<tr>
<td>Red and silver maple,</td>
<td>15,000</td>
<td>.46</td>
<td>10.00</td>
</tr>
<tr>
<td>Horbeam,</td>
<td>10,000</td>
<td>.31</td>
<td>12.00</td>
</tr>
<tr>
<td>Cottonwood,</td>
<td>2,500</td>
<td>.08</td>
<td>40.00</td>
</tr>
<tr>
<td><strong>Total</strong>,</td>
<td><strong>3,290,450</strong></td>
<td><strong>100.00</strong></td>
<td><strong>$33.82</strong></td>
</tr>
</tbody>
</table>

**MUSICAL INSTRUMENTS.**

A few manufacturers of this class specialize in building finished piano cases, and in the rough, which are called shells. Others make only the actions and keys. Others not included in this study buy their cases of one manufacturer, their actions of another, their sounding boards of a third, and their hardware from those specializing in that line, and operate merely in assembling the instrument and varnishing and finishing the exterior.

Chestnut which combines sufficient strength with light weight and has a special adaptability for holding glue is favored above all woods for backing veneered cases, and in the quantity consumed leads all other woods reported by the Pennsylvania piano makers and organ builders. It is entirely a case wood for piano cases. That so much of the chestnut reported should have been shipped from other states to the Pennsylvania piano makers is surprising because the chestnut tree is common throughout Pennsylvania, and in the production of chestnut lumber in 1912 Pennsylvania is among the three leading states. Other woods used for veneer backing were red oak, white pine, yellow poplar, and soft maple, because they possess qualities of sufficient strength, are stable in holding their shape, are easily worked, and have a special affinity for glue. The woods used for exterior finish include red oak, white oak, and red gum, Circassian walnut, sweet birch.
mahogany, black walnut, and sugar maple. They are bought to a large extent as veneer because in that form the selection of the most attractive figures is possible. For the backs, posts, and diagonal sweeps, several species—sugar maple, beech, soft maple, yellow birch, and white ash contribute the material because hardness and strength are the properties demanded. The bridges are of spruce, maple, and white ash, because they hold their shape well and are strong. The bottom boards are made of maple, oak, and hemlock, and the pedal boards of sugar and soft maple.

Spruce is the most vibrant wood and therefore foremost for piano sounding boards and sounding board ribs. The red spruce native of the Appalachian and New England regions, and white spruce of the Lake states, have probably been preferred; but since sounding boards are made from wide stock of uniform structure, trees suitable for this purpose are sought over great distances. At present, therefore, sounding board material is shipped from the Northern Pacific Coast states and British Columbia, where Sitka spruce supplies the demand. Sounding board material which shows a number of small annual rings indicating a slow rate of growth is preferred and purchased for high priced pianos. It is usually cut from trees on high altitudes where the development is fairly restricted.

Sugar maple, because it is a hardwood and easy to shape, is most used for actions, although some manufacturers use mahogany and sweet birch for action rails and red cedar and mahogany for hammer moulding and hammer shanks. Sugar maple, owing mostly to its hardness, is used to the exclusion of other woods for pin blocks. Red gum comes in for action parts, and the fact that it has been reported for this use in several other states besides Pennsylvania shows that its qualities have proved it practical for this kind of work.

Piano and organ keys are usually from the upper grades of white pine and sugar maple, but in Pennsylvania basswood also served except for sharps or flats which, like the organ stops, are made of ebony. Ebony was not reported in Pennsylvania nor was any mention made of the manufacture of keys and stops indicating that these commodities are brought into the State ready manufactured. White ash, white pine, sugar maple, yellow poplar, and mahogany furnished the material for the key bottoms because they have little tendency to warp.

Black walnut which is used in larger quantities in this industry than in any other is demanded almost entirely for the outside finish or cases of both pipe and reed organs. White oak, red oak, red gum, cherry, cotton gum, and mahogany also served with it for this use and for consoles and pilasters added only ornamentation. The frames and sills of organ cases were of shortleaf pine, chestnut, hemlock, and red oak, the wind chests and bellows of yellow poplar, basswood, white pine, sugar pine from California, and redwood, while white pine, shortleaf pine and yellow poplar answered for swell boxes. White pine is the principal wood for organ pipes but cherry, sugar pine, and redwood were also reported. Action chests are of a strong wood and red oak supplied most of the material. It is interesting to note that redwood has begun to be used by the eastern manufacturers for interior organ parts. Being fairly strong compared to its light weight, easily worked, free from pitch, and possessing the property of holding its shape well are the reasons why it is held in high favor with the manufacturers and will probably be used more extensively in the future.
Table 71.—Wood for Musical Instruments, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Feet b. m.</th>
<th>Per cent.</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory.</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chestnut</td>
<td>671,900</td>
<td>22.81</td>
<td>$24.81</td>
<td>$16,669</td>
<td>227,000</td>
<td>344,000</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>617,500</td>
<td>21.90</td>
<td>27.20</td>
<td>39,347</td>
<td>225,300</td>
<td>422,500</td>
</tr>
<tr>
<td>Spruce</td>
<td>325,500</td>
<td>11.05</td>
<td>48.34</td>
<td>14,075</td>
<td>235,500</td>
<td>235,500</td>
</tr>
<tr>
<td>Basswood</td>
<td>221,500</td>
<td>7.22</td>
<td>45.26</td>
<td>11,500</td>
<td>201,100</td>
<td>236,500</td>
</tr>
<tr>
<td>Mahogany</td>
<td>291,100</td>
<td>9.83</td>
<td>32.11</td>
<td>16,713</td>
<td>201,100</td>
<td>201,100</td>
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<tr>
<td>Yellow poplar</td>
<td>155,100</td>
<td>4.95</td>
<td>70.54</td>
<td>9,500</td>
<td>74,000</td>
<td>111,100</td>
</tr>
<tr>
<td>Black walnut</td>
<td>131,300</td>
<td>4.46</td>
<td>44.05</td>
<td>5,779</td>
<td>67,000</td>
<td>63,500</td>
</tr>
<tr>
<td>Red oak</td>
<td>102,000</td>
<td>3.46</td>
<td>35.25</td>
<td>3,200</td>
<td>50,000</td>
<td>82,000</td>
</tr>
<tr>
<td>Birch</td>
<td>90,000</td>
<td>3.09</td>
<td>35.25</td>
<td>2,150</td>
<td>50,000</td>
<td>40,000</td>
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<tr>
<td>White oak</td>
<td>88,900</td>
<td>2.99</td>
<td>47.20</td>
<td>4,743</td>
<td>33,000</td>
<td>55,000</td>
</tr>
<tr>
<td>White pine</td>
<td>88,000</td>
<td>2.99</td>
<td>34.56</td>
<td>3,041</td>
<td>88,000</td>
<td>88,000</td>
</tr>
<tr>
<td>Red gum</td>
<td>50,000</td>
<td>1.70</td>
<td>51.30</td>
<td>2,500</td>
<td>20,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Red and silver maple</td>
<td>44,000</td>
<td>1.49</td>
<td>26.82</td>
<td>1,100</td>
<td>44,000</td>
<td>44,000</td>
</tr>
<tr>
<td>Beech</td>
<td>20,000</td>
<td>0.68</td>
<td>23.80</td>
<td>440</td>
<td>20,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Cotton gum</td>
<td>20,000</td>
<td>0.68</td>
<td>23.80</td>
<td>440</td>
<td>20,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>19,000</td>
<td>0.67</td>
<td>31.52</td>
<td>657</td>
<td>19,000</td>
<td>19,000</td>
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<tr>
<td>Sugar pine</td>
<td>11,300</td>
<td>0.38</td>
<td>87.50</td>
<td>950</td>
<td>11,200</td>
<td>11,200</td>
</tr>
<tr>
<td>Redwood</td>
<td>10,000</td>
<td>0.34</td>
<td>40.60</td>
<td>400</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Ash</td>
<td>5,300</td>
<td>0.18</td>
<td>44.81</td>
<td>235</td>
<td>5,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Cherry (black)</td>
<td>4,800</td>
<td>0.15</td>
<td>75.68</td>
<td>233</td>
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<td>3,000</td>
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<tr>
<td>Lobolly pine</td>
<td>3,000</td>
<td>0.10</td>
<td>46.60</td>
<td>120</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Hemlock</td>
<td>2,500</td>
<td>0.09</td>
<td>35.00</td>
<td>91</td>
<td>1,600</td>
<td>1,000</td>
</tr>
<tr>
<td>Cypress (hard)</td>
<td>2,500</td>
<td>0.09</td>
<td>42.69</td>
<td>109</td>
<td>2,500</td>
<td>2,500</td>
</tr>
<tr>
<td>Total</td>
<td>2,946,000</td>
<td>100.00</td>
<td>$33.35</td>
<td>$115,982</td>
<td>745,200</td>
<td>2,156,800</td>
</tr>
</tbody>
</table>

MACHINERY AND ELECTRICAL APPARATUS.

The wood used in Pennsylvania for making parts of electrical equipment is represented by Table 72. There are fourteen species required, their principal uses being:

**Cable Reels.**
- White pine.
- Shortleaf pine.
- Hemlock.
- Red oak.
- Spruce.

**Wire Spools.**
- Sugar maple.
- Yellow poplar.
- Basswood.
- Red oak.

**Insulating Pieces.**
- Sugar maple.

**Relay Boxes.**
- White pine.
- Red oak.

**Switch Boards.**
- Mahogany.

**Wire Reels.**
- Hemlock.
- White pine.
- Red oak.
- Yellow poplar.
- Spruce.

**Electrical Cabinets and Cases.**
- White ash.
- Walnut.
- Red oak.
- Sugar maple.
- Mahogany.
- Longleaf pine.

**Trunking.**
- Shortleaf pine.
- White pine.

**Switch Signal Blades.**
- White pine.
- White ash.
- Sugar maple.
The largest amount and greatest number of woods of this industry go into cable and wire reels and spools for small size insulated wire. It will be noted that the softwood or conifers not plentiful in Pennsylvania are preferred in their manufacture which probably accounts for so great a percentage of the material being shipped in from other states. Hemlock and black walnut were the only woods listed as wholly home-grown. Pennsylvania wire manufacturers use a much larger number of wood reels than is indicated in this table but because they are manufactured elsewhere and brought to the State ready for use after being assembled merely, information concerning this material was not asked for. It had previously been accredited to the state where the reels were actually manufactured.

Table 72.—Wood for Machinery and Electrical Apparatus, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>968,200</td>
<td>35.66</td>
<td>$21.83</td>
</tr>
<tr>
<td>White pine</td>
<td>787,200</td>
<td>28.39</td>
<td>21.02</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>105,600</td>
<td>4.17</td>
<td>24.85</td>
</tr>
<tr>
<td>Hemlock</td>
<td>143,000</td>
<td>5.29</td>
<td>29.85</td>
</tr>
<tr>
<td>Spruce</td>
<td>87,700</td>
<td>3.33</td>
<td>28.00</td>
</tr>
<tr>
<td>White oak</td>
<td>80,000</td>
<td>2.85</td>
<td>28.38</td>
</tr>
<tr>
<td>Red oak</td>
<td>49,500</td>
<td>1.80</td>
<td>41.72</td>
</tr>
<tr>
<td>Ash</td>
<td>27,000</td>
<td>.92</td>
<td>20.00</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>70,000</td>
<td>.77</td>
<td>22.00</td>
</tr>
<tr>
<td>Mahogany</td>
<td>6,000</td>
<td>.22</td>
<td>100.00</td>
</tr>
<tr>
<td>Black walnut</td>
<td>2,500</td>
<td>.09</td>
<td>40.00</td>
</tr>
<tr>
<td>Basswood</td>
<td>2,000</td>
<td>.07</td>
<td>55.00</td>
</tr>
<tr>
<td>Longleaf pine</td>
<td>1,000</td>
<td>.04</td>
<td>25.00</td>
</tr>
<tr>
<td>Total</td>
<td>2,775,200</td>
<td>109.00</td>
<td>$33.54</td>
</tr>
</tbody>
</table>

WATER PIPES AND PUMPS.

Over two and one-half million feet of lumber is demanded annually in Pennsylvania for making wooden water pipes and wood linings for iron water pipes. In coal mining operations the chemical action of the water that collects there holds in solution various minerals, chiefly sulphur, that have a deleterious effect upon iron. Pipes employed for conducting this water away, when of iron, are usually lined with wood to prevent corrosion or, as in many cases, are made entirely of wood. White pine is demanded in the largest quantities for both of these purposes. The average price indicates that the lower grades were employed, as were the sugar maple, beech, and sweet birch and other species were used. Most of the white pine reported was State-grown, which is another instance of an industry at present depending on the forest resources of the State. Yellow poplar, the most expensive wood, came from a distance and went entirely into liquor logs, both for well and boat pumps, the latter used principally on boats for transporting ore coal and other heavy freight. In other states, according
to quantity, cucumber is preferred for liquor logs but unless it was mixed with yellow poplar, as is frequently done in marketing this wood, none was used in Pennsylvania.

Table 73.—Wood for Pumps, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>White pine</td>
<td>2,892,000</td>
<td>77.71</td>
<td>$24.50</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>406,000</td>
<td>14.56</td>
<td>17.00</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>100,000</td>
<td>3.71</td>
<td>15.00</td>
</tr>
<tr>
<td>Birch</td>
<td>20,000</td>
<td>1.86</td>
<td>15.00</td>
</tr>
<tr>
<td>Beech</td>
<td>50,000</td>
<td>1.86</td>
<td>15.00</td>
</tr>
<tr>
<td>Total</td>
<td>2,602,000</td>
<td>100.00</td>
<td>$23.90</td>
</tr>
</tbody>
</table>

BASKETS AND VENEER PACKAGES.

The products of this industry are made exclusively of veneer cut from close grained non-resinous woods with the tops and bottoms of thicker material—thin lumber,—which is often sawed from the cores (that part of the log after the veneer has been removed), or from low grades of lumber. Formerly splint baskets were the kinds used. There is a wide difference between split wood and woods suitable for veneers. The former require straight grained woods, easily rived. The sapwood of white oak, basket oak, cow oak, ash, and hickory were among those frequently used. After the introduction of rotary veneer machines they began to make them, as they are doing in Pennsylvania, from veneer cut into wide strips and woven; and cheaper woods, usually with close compact cross grain without much resin, have taken the place of the splint woods. For stave baskets a great deal of the veneer is cut into staves varying in length from 12 inches to 18 inches. The bottom is of solid edged lumber, to which the narrow ends of the staves are tacked. The staves are held in place at the top and added strength is given at the bottom by the use of thin cut rims of white elm, beech, and soft maple. These baskets are made in many sizes and have a bent handle which is often of beech, hard maple, and white elm. Various woods answer for the veneer part of the stave baskets; the principal ones reported by Pennsylvania manufacturers are beech, soft maple, elm, ash, birch, and black gum.

Other commodities made by this industry include packages used in marketing fruits and vegetables such as tills, hoppers, vendors' trays, and the like. This industry in Pennsylvania used a comparatively small amount of wood compared with the amounts used in Delaware, Maryland, Virginia, and North Carolina. The number of firms specializing in this line as well as in basket making justifies the grouping of the information concerning this line of manufacture into a separate industry instead of including it with the material going into boxes and crates, as has been the case in a number of other state reports where the veneer package industry is relatively unimportant.
Table 74—Wood for Baskets and Veneer Packages, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Beech,</td>
<td>1,075,000</td>
<td>40.23</td>
<td>$18.62</td>
<td>$26,092</td>
<td>948,000</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>549,000</td>
<td>26.45</td>
<td>$18.15</td>
<td>9,562</td>
<td>549,000</td>
</tr>
<tr>
<td>White pine,</td>
<td>220,000</td>
<td>8.57</td>
<td>21.00</td>
<td>4,830</td>
<td>220,000</td>
</tr>
<tr>
<td>Basswood,</td>
<td>230,000</td>
<td>8.29</td>
<td>20.18</td>
<td>4,440</td>
<td>230,000</td>
</tr>
<tr>
<td>Red and silver maple,</td>
<td>145,000</td>
<td>5.90</td>
<td>20.00</td>
<td>2,500</td>
<td>145,000</td>
</tr>
<tr>
<td>Red oak,</td>
<td>125,000</td>
<td>4.66</td>
<td>23.00</td>
<td>3,875</td>
<td>125,000</td>
</tr>
<tr>
<td>White elm,</td>
<td>115,000</td>
<td>4.28</td>
<td>21.57</td>
<td>3,215</td>
<td>115,000</td>
</tr>
<tr>
<td>Chestnut,</td>
<td>100,000</td>
<td>3.73</td>
<td>19.00</td>
<td>1,800</td>
<td>100,000</td>
</tr>
<tr>
<td>Birch,</td>
<td>70,000</td>
<td>2.61</td>
<td>22.43</td>
<td>1,570</td>
<td>70,000</td>
</tr>
<tr>
<td>Ash,</td>
<td>30,000</td>
<td>1.12</td>
<td>21.00</td>
<td>620</td>
<td>30,000</td>
</tr>
<tr>
<td>Black gum,</td>
<td>20,000</td>
<td>.74</td>
<td>22.00</td>
<td>440</td>
<td>20,000</td>
</tr>
<tr>
<td>Total,</td>
<td>2,683,000</td>
<td>100.60</td>
<td>$19.44</td>
<td>$52,156</td>
<td>2,468,000</td>
</tr>
</tbody>
</table>

FRAMES AND MOULDINGS.

Woods used in Pennsylvania for picture frame mouldings—plain, enameled, embossed, and carved,—electric wire moulding, and frames for school slates and blackboards, are listed in Table 75. This industry excludes all mouldings employed in the interior finish of houses except those which are put in place by the paper hangers for drop ceiling work and for picture hanging. Furniture, casket, and fixture moulding are grouped with the material respectively for the industries making these commodities.

Twenty-one woods are called on for the manufacture of the commodities mentioned above and scarcely one-fourth of the total quantity was cut from trees that grow within the State. Basswood is the principal material used, exceeding three times the total of all others. It went principally for fancy finish such as gilt, enamel, and embossed mouldings. Basswood not only holds paint well but keeps its shape and is easy to work and to cut, nail, and fit to place. Yellow poplar met part of the demand but was consumed in relatively small quantities. Frames displaying the figure of the wood are usually the highest priced moulding. Mahogany, white oak, black walnut, ash, and chestnut are called on by the Pennsylvania manufacturers for these lines of work if they are finished in oil or wax to bring out the natural beauty of the wood or else are darkened by stains or ammonia fumes for mission effects. Red gum is an important wood in this industry. It stood third in a similar table in Illinois, second in Michigan, and fourth in New York. It answers with sweet birch for the imitation of expensive woods.

Considerably over half a million feet of lumber each year is demanded in Pennsylvania for mouldings to conceal and protect electric wiring on walls and ceilings. Shortleaf pine and red oak were used in small quantities, but basswood met practically all the demand. Slate frames, except those covered with cloth, were entirely of beech. Basswood answered for the felt-bound ones and together with spruce supplied the material for blackboard frames.
Table 75.—Wood for Frames and Mouldings, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. &amp; o. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Beech</td>
<td>1,200,000</td>
<td>45.82</td>
<td>$20.05</td>
<td>$24,100</td>
<td>600,000</td>
</tr>
<tr>
<td>Basswood</td>
<td>102,000</td>
<td>31.41</td>
<td>22.69</td>
<td>26,825</td>
<td>320,000</td>
</tr>
<tr>
<td>White oak</td>
<td>107,000</td>
<td>4.69</td>
<td>55.46</td>
<td>5,584</td>
<td>22,000</td>
</tr>
<tr>
<td>Spruce</td>
<td>100,000</td>
<td>3.82</td>
<td>30.80</td>
<td>3,000</td>
<td></td>
</tr>
<tr>
<td>Chestnut</td>
<td>33,000</td>
<td>2.35</td>
<td>22.41</td>
<td>2,084</td>
<td>25,000</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>87,000</td>
<td>3.32</td>
<td>35.51</td>
<td>3,550</td>
<td></td>
</tr>
<tr>
<td>Red gum</td>
<td>50,000</td>
<td>1.91</td>
<td>50.00</td>
<td>1,500</td>
<td></td>
</tr>
<tr>
<td>Sugar maple</td>
<td>20,900</td>
<td>.75</td>
<td>23.50</td>
<td>450</td>
<td>20,000</td>
</tr>
<tr>
<td>Mahogany</td>
<td>15,000</td>
<td>.57</td>
<td>130.00</td>
<td>1,800</td>
<td></td>
</tr>
<tr>
<td>Red oak</td>
<td>12,000</td>
<td>.46</td>
<td>44.66</td>
<td>528</td>
<td>2,000</td>
</tr>
<tr>
<td>Black walnut</td>
<td>10,500</td>
<td>.49</td>
<td>30.67</td>
<td>847</td>
<td>4,500</td>
</tr>
<tr>
<td>Ash</td>
<td>10,000</td>
<td>.38</td>
<td>33.00</td>
<td>830</td>
<td>10,000</td>
</tr>
<tr>
<td>Birch</td>
<td>7,500</td>
<td>.29</td>
<td>23.00</td>
<td>665</td>
<td></td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>5,000</td>
<td>.19</td>
<td>30.00</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,619,000</td>
<td>100.00</td>
<td><strong>$25.00</strong></td>
<td><strong>$65,480</strong></td>
<td><strong>1,046,500</strong></td>
</tr>
</tbody>
</table>

REFRIGERATORS AND KITCHEN CABINETS.

Table 76 lists the woods used in Pennsylvania in the manufacture of refrigerators, kitchen cabinets, and cupboards. The combination cabinets and cupboards have become almost indispensable to housekeepers in that they provide a convenient place for all the accessories to cooking that are necessary to be kept at hand. In late years they have become popular and factories making them specialize in this line. Because they are sold at low prices they are not usually made of the upper grades of lumber that are employed in the manufacture of furniture. Yellow poplar and oak, both red and white, and to a limited extent birch, are the woods mainly used in Pennsylvania for the case or outside work. The interior parts, such as shelving, compartment partitions, drawer sides and bottoms, etc., are made of yellow poplar, spruce, cottonwood, maple and beech. The backs of these cases are also made of low grade material and none of special quality or kind was demanded. Almost any cheap species, easily worked, will answer. In consequence, a proportion of nearly all listed in the table served for this use. Shortleaf pine, spruce, and white oak were reported for framing.

Refrigerators run from what are practically small ice boxes to large sectional cases the size of a room used by butchers and others doing business requiring cold storage equipment. Refrigerators and chests for domestic purposes call for soft woods of conifers for linings. The reason for this is that many hardwoods have an odor and therefore are unfit for a storage compartment of perishable foodstuffs. Spruce is the principal lining material in Pennsylvania, and was also employed for ice pan supports. Cypress in some states is used for this purpose and in others white and yellow pine is used. The siding or outer case is usually hardwood,—white oak, white ash, red oak, birch, cherry, and red gum. They are selected as being not only best for the work intended, but the exterior properly finished gives the chest the appearance of an article of furniture. The case is not attached.
to the lining, since between the lining and the case there is provided an insulation space, which in some refrigerators is filled with materials like sawdust, cork, and charcoal, and in other refrigerators the space is left unfilled, the dead air being regarded the most effective insulation. Lumber for refrigerators must be well dried as otherwise the extreme variations of temperature are apt to cause it to buckle and check. The large refrigerators or cooling rooms are built to order in the place in which they are used. Though hardwoods are called on for the exterior or case work of the higher priced work, softwoods answer to a considerable extent both for the linings and cases. The materials for both of these parts are usually rather thick and are preferred to guard more effectively against the penetration of heat. It is possible, so the Pennsylvania manufacturers claim, to secure a temperature of 38 degrees from ice alone in these large refrigerators.

Table 76.—Wood for Refrigerators and Kitchen Cabinets, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Per cent.</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory.</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow poplar</td>
<td>566,200</td>
<td>22.88</td>
<td>$23.27</td>
<td>$13,069</td>
<td>363,000</td>
<td>203,200</td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>453,750</td>
<td>18.42</td>
<td>27.07</td>
<td>12,384</td>
<td>12,384</td>
<td>12,384</td>
</tr>
<tr>
<td>White oak</td>
<td>448,450</td>
<td>18.26</td>
<td>20.44</td>
<td>12,540</td>
<td>250,000</td>
<td>198,450</td>
</tr>
<tr>
<td>Spruce</td>
<td>313,500</td>
<td>12.78</td>
<td>37.39</td>
<td>15,471</td>
<td>150,000</td>
<td>222,800</td>
</tr>
<tr>
<td>Cottonwood</td>
<td>150,900</td>
<td>6.65</td>
<td>4.00</td>
<td>4,800</td>
<td>150,000</td>
<td></td>
</tr>
<tr>
<td>Red oak</td>
<td>117,450</td>
<td>4.77</td>
<td>41.91</td>
<td>4,222</td>
<td></td>
<td>117,450</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>89,750</td>
<td>3.48</td>
<td>25.71</td>
<td>2,318</td>
<td>80,750</td>
<td></td>
</tr>
<tr>
<td>Birch</td>
<td>65,000</td>
<td>2.64</td>
<td>25.15</td>
<td>2,000</td>
<td>20,000</td>
<td>35,000</td>
</tr>
<tr>
<td>Beech</td>
<td>55,000</td>
<td>2.27</td>
<td>17.25</td>
<td>1,925</td>
<td>35,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Hemlock</td>
<td>37,100</td>
<td>1.50</td>
<td>23.13</td>
<td>821</td>
<td>35,100</td>
<td>4,000</td>
</tr>
<tr>
<td>Ash</td>
<td>32,000</td>
<td>1.30</td>
<td>23.19</td>
<td>1,222</td>
<td>4,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Basswood</td>
<td>21,600</td>
<td>0.88</td>
<td>31.11</td>
<td>672</td>
<td>1,600</td>
<td>20,000</td>
</tr>
<tr>
<td>Chestnut</td>
<td>11,800</td>
<td>0.48</td>
<td>23.65</td>
<td>331</td>
<td>11,800</td>
<td></td>
</tr>
<tr>
<td>Cherry (black)</td>
<td>7,500</td>
<td>0.30</td>
<td>62.50</td>
<td>460</td>
<td>7,500</td>
<td></td>
</tr>
<tr>
<td>Red gum</td>
<td>2,900</td>
<td>0.12</td>
<td>59.60</td>
<td>145</td>
<td>2,900</td>
<td></td>
</tr>
<tr>
<td>White pine</td>
<td>500</td>
<td>0.02</td>
<td>23.09</td>
<td>14</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2,463,800</td>
<td>100.00</td>
<td>$30.73</td>
<td>$75,729</td>
<td>1,022,250</td>
<td>1,461,550</td>
</tr>
</tbody>
</table>

**EXCELSIOR.**

Formerly excelsior was called wood fiber but later it received its present name given it by an upholstery firm in its advertisement. In 1860 this commodity was first placed on the market by a Maine manufacturer, but it was not called on to meet much of a demand for a decade; then with the improved machinery invented by Europeans the manufacture of excelsior was greatly facilitated. Since that time it has become a staple product. According to a recent report by the Forest Service and the Bureau of the Census, it was ascertained that 85,000,000 feet of forest material is yearly demanded for its manufacture. Pennsylvania is not so important an excelsior state as either Virginia or New York, the former being second and the latter third. Pennsylvania is the tenth, consuming each year over one and a half million feet of wood all cut within the State. In the New England
and Lake states, aspen or popple, basswood and willow are used; in Virginia and North Carolina, scrub and loblolly pine, yellow poplar, and white pine meet the demand. In the Mississippi Valley states excelsior makers report the use of cottonwood, yellow poplar and yellow pine, and in the Pacific coast states black cottonwood alone furnishes all of the demand. For the United States, in quantity, aspen is the favorite excelsior wood, yellow pine next. Pennsylvania manufacturers prefer basswood and yellow poplar next. These woods with aspen make the best grades of excelsior. The consumption of yellow poplar in this line of manufacture is greater in Pennsylvania than in any other state, though it is used in eight others. Butternut appears in only one other state, New Jersey, and, next to Michigan, beech finds its greatest demand in Pennsylvania for excelsior. Chestnut excelsior is solely a product of Pennsylvania and until this investigation, the Forest Service had received no record of the use of this wood for this purpose. Excelsior wood should be straight grained, soft, dense, light in weight and color, moderately non-brittle, stiff when dry, and odorless.

The raw material used for making excelsior comes in the form of bolts and split billets, usually in lengths the multiples of 18 inches. The wood is thoroughly seasoned before manufacturing but if seasoned too long it becomes brittle and often is injured by certain forms of incipient decay. The billets are set in the excelsior machines and without further handling are shaved into the finished product. The output of an eight block machine varies from 6,000 to 10,000 pounds per day according to the fineness of the product. From the cutting machines the excelsior is taken to the baling room where presses, similar in operation to hay balers, put it into marketable form.

The first use of excelsior was for packing wares liable to injury in transportation, but later it proved valuable for filling cheap mattresses and upholstered furniture. In France not only does excelsior answer for this purpose, but highly improved machinery has made it possible to manufacture a product of such fine grade as to be a fit substitute for the absorbent lint used in hospital, or filtration purposes, and for weaving into floor coverings. Various grades of excelsior are frequently dyed without losing their elasticity. They serve as an ornamental packing material, and for color schemes in displaying goods in show cases, but none was reported in Pennsylvania. Table 77 gives the available statistics.

Table 77.—Wood for Excelsior, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Post b. m.</td>
<td>Per cent.</td>
<td>Avg. cost per 1,000 ft.</td>
<td>Total cost f. o. b. factory.</td>
<td>Post b. m.</td>
</tr>
<tr>
<td>Basswood</td>
<td>749,660</td>
<td>46.53</td>
<td>313.77</td>
<td>810,315</td>
<td>749,660</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>685,000</td>
<td>40.50</td>
<td>15.00</td>
<td>10,030</td>
<td>685,000</td>
</tr>
<tr>
<td>Beech</td>
<td>116,500</td>
<td>6.23</td>
<td>15.00</td>
<td>1,718</td>
<td>116,500</td>
</tr>
<tr>
<td>White pine</td>
<td>63,500</td>
<td>3.78</td>
<td>15.00</td>
<td>553</td>
<td>63,500</td>
</tr>
<tr>
<td>Butternut</td>
<td>30,000</td>
<td>1.78</td>
<td>15.00</td>
<td>450</td>
<td>30,000</td>
</tr>
<tr>
<td>Aspen (popple)</td>
<td>30,000</td>
<td>1.78</td>
<td>15.66</td>
<td>450</td>
<td>30,000</td>
</tr>
<tr>
<td>Chestnut</td>
<td>5,000</td>
<td></td>
<td>14.00</td>
<td>70</td>
<td>5,000</td>
</tr>
<tr>
<td>Total</td>
<td>1,682,000</td>
<td>100.00</td>
<td>314.38</td>
<td>234,916</td>
<td>1,682,000</td>
</tr>
</tbody>
</table>
PLAYGROUND EQUIPMENT.

Under this industry are listed the woods used for making apparatus or wooden parts thereof that contribute equipment for public parks and play-grounds. Swings, merry-go-rounds, coasting boards, ferris wheels, croquet sets, see-saws, shoot-the-chutes, etc., are examples of the principal ones. Swings, however, were the only commodities manufactured in Pennsylvania. The total of the following table, 1,507,300 feet, represents the amount of material that is required each year for their manufacture. Not all of this material went into playground swings since swings of every description are included and some required more lumber for making than others. According to quantity consumed, lawn and porch swings are the most important. The latter answer not only for amusement but are also useful as furniture,—a suspended settee for porch appointments. Of late this commodity has grown rapidly in favor.

Nine woods are listed in Table 78, and those species best suited for swing material, i.e., those possessing the necessary inherent qualities of strength, hardness, and durability when exposed are the ones included. The oaks, beech, and ashes in the order named, were the most prominent hardwoods. The chief conifers used were longleaf, shortleaf, and loblolly pine, the last named being used in the largest quantities. The pines answered mostly for lawn swings and principally for the staffs and the frame work or super-
structure.

Table 78.—Wood for Playground Equipment, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000.</td>
<td>$147,077</td>
</tr>
<tr>
<td>Red oak,</td>
<td>45,300</td>
<td>20.27</td>
<td>$32.23</td>
</tr>
<tr>
<td>Loblolly pine,</td>
<td>46,000</td>
<td>26.54</td>
<td>28.00</td>
</tr>
<tr>
<td>Shortleaf pine,</td>
<td>240,000</td>
<td>15.92</td>
<td>54.00</td>
</tr>
<tr>
<td>White oak,</td>
<td>151,000</td>
<td>19.02</td>
<td>39.95</td>
</tr>
<tr>
<td>Beech,</td>
<td>130,000</td>
<td>8.62</td>
<td>26.46</td>
</tr>
<tr>
<td>Ash</td>
<td>7,000</td>
<td>4.38</td>
<td>30.00</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>36,000</td>
<td>1.53</td>
<td>26.90</td>
</tr>
<tr>
<td>Loblolly pine,</td>
<td>7,000</td>
<td>.46</td>
<td>52.00</td>
</tr>
<tr>
<td>Total</td>
<td>1,567,300</td>
<td>100.00</td>
<td>$410,106</td>
</tr>
</tbody>
</table>

PRINTING MATERIAL.

Electrotype backing, woodcut engravings, and wood type are the only products listed under this head. Four woods were demanded for their making. Cherry heads the list as to quantity and went entirely into electrotype mountings, which is probably the most exacting use it has. Because it is less liable to warp than any other American woods that possess the other requisite qualities for this use is the reason the electrotypers demand cherry exclusively. Its strength and density, its resistance to splitting, and its property to work smoothly are other important qualities which com-
mend it. Electrotype backing is not made, as formerly, entirely from solid lumber. Glue is to a large extent called on to put together narrow strips or thin layers for built-up mountings that are beginning to be used extensively. The growing scarcity of cherry, together with the rapidly increasing demand for this line of work requires the electrotypers to pay a price over twice as great as that asked five years ago.

For wood engravings, boxwood from Turkey and Russia was the only wood reported and in other states as well it met most of the demand, especially for high grade work. It is the most expensive wood that is listed in any industry. The price, $1,300 per thousand feet, is little, if any, above the usual cost of this wood for engravings and it is usually sold in terms of cubic inches, four cents being the average reported in Philadelphia. Owing to the high cost of this wood, engravers employ domestic substitutes to a large extent, but they are for the cheaper grades of work. Sugar maple, apple, and pearwood are the kinds most used.

Metal has almost entirely replaced wood for printer's type. Wood is still called for to a limited extent, chiefly for manufacturing large size type such as is used for printing billboard advertisements. Formerly boxwood furnished the material, but its high cost now stands in the way and sugar maple, which was the only wood reported in Pennsylvania, now furnishes most of the supply.

Table 79.—Wood for Printing Material, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Cherry (black)</td>
<td>1,156,000</td>
</tr>
<tr>
<td>Birch</td>
<td>30,000</td>
</tr>
<tr>
<td>Red and silver maple</td>
<td>25,000</td>
</tr>
<tr>
<td>Mahogany</td>
<td>23,500</td>
</tr>
<tr>
<td>Redwood</td>
<td>20,000</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>5,600</td>
</tr>
<tr>
<td>Beech</td>
<td>2,000</td>
</tr>
<tr>
<td>Applewood</td>
<td>1,000</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>350</td>
</tr>
<tr>
<td>Hickory</td>
<td>500</td>
</tr>
<tr>
<td>Boxwood (Turkish)</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>1,274,326</td>
</tr>
</tbody>
</table>

*Less than 1-100 of 1 per cent.

LADDERs.

Nine manufacturers reported the making of ladders, including step ladders, travelling store ladders, firemen's ladders, and extension ladders used by painters and other mechanics. In other state reports ladders have been classified under woodenware but owing to the number of concerns in Pennsylvania specializing in making them and because of the large quantity of wood which they annually consume, their presentation under a separate heading is justified.
Loblolly pine and basswood supplied the largest part of the demand and were called on mostly for step ladders because being strong and at the same time light in weight they are well adapted for this line of use. Beech was used extensively for steps because of its strength, and in order not to make the ladders too heavy, it was used with a lighter wood for styles. Other step ladder woods were cypress, longleaf pine, and spruce. The staffs, which are the hinged supports, are made of various woods and usually of the same kind as the styles except those of considerable length where extra strength is desired. In order not to add too much weight staffs are made of strips of small dimension and to meet the stress imposed are well braced and made from material free from imperfections. For extension and firemen's ladders high grades are used. Spruce is most in demand for the styles or uprights while for the ladder rungs, hickory, ash, beech, and maple were employed in the order mentioned.

Travelling ladders are so named because they are readily moved by the occupant without descending. They are used in stores. Pulleys, movable on a track, are attached at the top, and in some designs the bottoms rest on castors. Lightness of weight is not a consideration in these as in step ladders and thicker materials and heavier woods are therefore used. Long-leaf pine was used mostly but sugar maple, loblolly, and shortleaf pine also met a part of the demand.

Sixty-five per cent. of the ladder woods were kinds that do not grow plentifully and some not at all in Pennsylvania. This accounts for only 29 per cent. of the requirements of this industry being met by the forests of the State. Of the kinds reported common to Pennsylvania, the entire amounts consumed were home-grown except basswood, nearly one-half of which was brought in from forests of other states.

Table 80.—Wood for Ladders, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Loblolly pine,</td>
<td>400,000</td>
<td>36.68</td>
<td>$29.00</td>
<td>$8,000</td>
<td>400,000</td>
</tr>
<tr>
<td>Basswood,</td>
<td>275,000</td>
<td>24.31</td>
<td>28.18</td>
<td>8,025</td>
<td>150,000</td>
</tr>
<tr>
<td>Spruce,</td>
<td>191,000</td>
<td>17.33</td>
<td>26.40</td>
<td>8,250</td>
<td>191,000</td>
</tr>
<tr>
<td>Cypress (bold),</td>
<td>62,500</td>
<td>5.64</td>
<td>54.64</td>
<td>3,415</td>
<td>82,500</td>
</tr>
<tr>
<td>Longleaf pine,</td>
<td>50,000</td>
<td>4.51</td>
<td>28.00</td>
<td>1,400</td>
<td>50,000</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>50,000</td>
<td>4.51</td>
<td>27.00</td>
<td>1,350</td>
<td>50,000</td>
</tr>
<tr>
<td>Hickory,</td>
<td>22,000</td>
<td>2.18</td>
<td>18.57</td>
<td>625</td>
<td>22,000</td>
</tr>
<tr>
<td>Beech,</td>
<td>4,000</td>
<td>0.36</td>
<td>10.00</td>
<td>450</td>
<td>4,000</td>
</tr>
<tr>
<td>Ash,</td>
<td>4,000</td>
<td>0.36</td>
<td>21.96</td>
<td>84</td>
<td>4,000</td>
</tr>
<tr>
<td>Yellow poplar,</td>
<td>1,168,500</td>
<td>100.00</td>
<td>$29.16</td>
<td>$22,321</td>
<td>251,000</td>
</tr>
<tr>
<td>Total,</td>
<td>1,168,500</td>
<td>100.00</td>
<td>$29.16</td>
<td>$22,321</td>
<td>251,000</td>
</tr>
</tbody>
</table>
ELEVATORS.

Fifteen manufacturers reported using wood for the manufacture and repair of freight and passenger elevators, both hand power and traction, lifts, dumb waiters, etc., and many of them are important industries maintaining formidable establishments. In the production of the finished commodity they give Pennsylvania a high standing among the states but in consumption of lumber they report the use of only a little over a million feet, annually, making this industry 35th in the list or 17th from the last. Not many years ago lumber was the most essential material the elevator manufacturers used but generally steel construction began to take the place of wood and proved to be such a practical and desirable substitute that now for power elevators, especially passenger, wood is employed only incidentally for a few minor parts. The sight of the old time wooden passenger elevator car today is an exception, but on the other hand many small freight elevators and dumb waiters are made entirely of wood, the initial cost being much lower than steel. Some are made that are part steel and part wood. The rough lumber demanded for elevator construction is shown in Table 81. Eleven kinds were reported and their principal uses are as follows:

PASSENGER ELEVATORS.

<table>
<thead>
<tr>
<th>Car Platforms</th>
<th>Overhead Machine Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar maple.</td>
<td>Sugar maple.</td>
</tr>
</tbody>
</table>

FREIGHT ELEVATORS.

<table>
<thead>
<tr>
<th>Guide Posts</th>
<th>Panel Sides</th>
</tr>
</thead>
<tbody>
<tr>
<td>White pine.</td>
<td>Longleaf pine.</td>
</tr>
<tr>
<td>Longleaf pine.</td>
<td>Loblolly pine.</td>
</tr>
<tr>
<td>Norway pine.</td>
<td>White oak.</td>
</tr>
<tr>
<td>Sugar maple.</td>
<td>Sugar maple.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Guide Strips</th>
<th>Overhead Beams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar maple.</td>
<td>Sugar maple.</td>
</tr>
<tr>
<td>White ash.</td>
<td>White ash.</td>
</tr>
<tr>
<td></td>
<td>Longleaf pine.</td>
</tr>
<tr>
<td></td>
<td>Loblolly pine.</td>
</tr>
<tr>
<td></td>
<td>White ash.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Upper Frames</th>
<th>Car Beams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar maple.</td>
<td>Sugar maple.</td>
</tr>
<tr>
<td>Longleaf pine.</td>
<td>White elm.</td>
</tr>
<tr>
<td>White ash.</td>
<td>White oak.</td>
</tr>
<tr>
<td></td>
<td>Norway pine.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enclosures</th>
<th>Weight Jams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longleaf pine.</td>
<td>Longleaf pine.</td>
</tr>
<tr>
<td>White pine.</td>
<td>Sugar maple.</td>
</tr>
<tr>
<td>Loblolly pine.</td>
<td>White elm.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gates</th>
<th>Footing Pieces</th>
</tr>
</thead>
<tbody>
<tr>
<td>White oak.</td>
<td>Longleaf pine.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Car Platforms</th>
<th>Shaft Lining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spruce.</td>
<td>White oak.</td>
</tr>
<tr>
<td>Cork elm.</td>
<td>Hemlock.</td>
</tr>
<tr>
<td>Longleaf pine.</td>
<td>Chestnut.</td>
</tr>
<tr>
<td>Sugar maple.</td>
<td>Loblolly pine.</td>
</tr>
</tbody>
</table>
This industry does not depend on the forests of the State to any great extent as a source of raw material. Less than one-quarter of the total was grown in Pennsylvania because the lumber chiefly used in elevator construction is of kinds that are rarely, if at all, cut in Pennsylvania. Longleaf, Norway or red, loblolly, and shortleaf pine, and cypress together constitute over 52 per cent. of the total. Sugar maple and ash were the principal home-grown woods demanded and from the average prices recorded the upper grades were principally purchased. The available statistics are:

Table 81.—Wood for Elevators, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Longleaf pine</td>
<td>269,900</td>
<td>36.75</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>131,200</td>
<td>14.00</td>
</tr>
<tr>
<td>Norway pine</td>
<td>100,000</td>
<td>9.71</td>
</tr>
<tr>
<td>Loblolly pine</td>
<td>96,000</td>
<td>9.51</td>
</tr>
<tr>
<td>Ash</td>
<td>97,000</td>
<td>5.22</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>82,600</td>
<td>13.50</td>
</tr>
<tr>
<td>White pine</td>
<td>62,200</td>
<td>15.10</td>
</tr>
<tr>
<td>White oak</td>
<td>38,200</td>
<td>5.77</td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>46,000</td>
<td>4.56</td>
</tr>
<tr>
<td>Cork elm</td>
<td>30,500</td>
<td>2.02</td>
</tr>
<tr>
<td>White elm</td>
<td>12,000</td>
<td>1.19</td>
</tr>
<tr>
<td>Cypress (bald)</td>
<td>10,500</td>
<td>.90</td>
</tr>
<tr>
<td>Spruce</td>
<td>10,000</td>
<td>.59</td>
</tr>
<tr>
<td>Chestnut</td>
<td>4,500</td>
<td>.40</td>
</tr>
<tr>
<td>Hemlock</td>
<td>3,800</td>
<td>.38</td>
</tr>
<tr>
<td>Total</td>
<td>1,085,900</td>
<td>100.00</td>
</tr>
</tbody>
</table>

CANES AND WHIPS.

The variety of woods used for canes, umbrella and parasol handles exceeds that reported by any other industry in Pennsylvania. Table 82 includes 72 species of wood. Because the raw material for these commodities is most usually purchased in billet, pole or twig form, and very frequently by the piece, it was impractical to reduce the amount of the material reported to board feet except in a few cases when certain woods were used in comparatively large quantities. The total of Table 82 does not, therefore, represent the entire amount of wood that is used for manufacturing these
products in Pennsylvania, but in order that the remarkable number of different kinds of wood,—many of which have not been reported in any other state report,—may be presented, they have been listed in the table without accompanying statistics. Most of them are high priced and a majority are foreign woods. As many as were readily available will be found included in the preceding illustration. A large per cent. of all the sugar maple and soft maple shown in the table went for dowels or shanks of umbrellas and parasols, while the entire amount of beech answered for whip stocks and handles. Reed cut in large quantities from rattan shipped from the Orient was also used for whips but it was reported in pounds and could not be reduced to feet to be included in the table.

Table 82.—Wood for Whips, Canes, and Umbrella Sticks, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft. at factory.</td>
</tr>
<tr>
<td>Beech</td>
<td>260,500</td>
<td>30.18</td>
<td>$21.91</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>241,100</td>
<td>27.31</td>
<td>17.57</td>
</tr>
<tr>
<td>Ebony</td>
<td>124,150</td>
<td>14.06</td>
<td>15.94</td>
</tr>
<tr>
<td>Red and silver maple</td>
<td>107,000</td>
<td>12.12</td>
<td>26.45</td>
</tr>
<tr>
<td>Congo</td>
<td>60,000</td>
<td>6.30</td>
<td>122.00</td>
</tr>
<tr>
<td>Hickory</td>
<td>26,000</td>
<td>3.08</td>
<td>55.85</td>
</tr>
<tr>
<td>Balsamwood</td>
<td>25,600</td>
<td>2.96</td>
<td>52.28</td>
</tr>
<tr>
<td>Beechwood</td>
<td>20,000</td>
<td>2.37</td>
<td>50.00</td>
</tr>
<tr>
<td>Basswood</td>
<td>12,500</td>
<td>1.42</td>
<td>32.48</td>
</tr>
<tr>
<td>Weichsel roots</td>
<td>30</td>
<td></td>
<td>546.60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>882,880</strong></td>
<td><strong>100.00</strong></td>
<td><strong>382.90</strong></td>
</tr>
</tbody>
</table>

*Less than 1-100 of 1 per cent.

Woods for canes and parasol and umbrella handles purchased by the piece:

- Apple
- Apricot
- Arbor vitae
- Bamboo
- Birch
- Black ash
- Black gum
- Black walnut
- Butternut
- Cherry
- Chestnut
- Chestnut oak
- Circassian walnut
- Corra
- Crab apple
- Cucumber
- Dogwood
- Elm
- English oak
- French oak
- Furze
- Hazelnut
- Haw (black thorn)
- Holly
- Hop tree (hopwood)
- Hornbeam (ironwood)
- Huckleberry tree
- Lancewood
- Laurel
- Lilac
- Madagascar
- Mahogany
- Malacca (rattan)
- Morello cherry (sweet cherry)
- Orange wood
- Osage orange
- Paper birch (gray birch)
- Partridge
- Pear tree
- Persimmon
- Plum
- Poison Sumach
- Quince
Red cedar (juniper).  
Red oak (jersey oak).  
Rice root.  
Sassafras.  
Savin (red cedar).  
Scotch thistle.  
Siberian crab.  
Slippery elm.  
Striped maple (swamp dogwood).  

Sweet (cherry) birch.  
Sycamore.  
Whangee.  
White ash.  
White oak.  
White thorn.  
Willow.  
Yellow birch.  
Yellow poplar (hickory poplar).  

PLUMBERS' WOODWORK.

In connection with bathroom and toilet furnishings and other forms of plumbing installation there are certain useful commodities made of wood which have been grouped under this heading and the materials used for making them presented in Table 83. Drainboards, which serve as dish washing tables, connected with the sink, call for a large quantity of wood which, on account of holding its shape, ash alone supplied. Usually these boards are grooved to facilitate drainage. Sweet birch, finished with a high polish, was mainly used for bath stools, some in imitation of mahogany but most of them painted or enameled white, the birch being specially adaptable to both kinds of finish. Water closet seats, lids, and tanks, are the other commodities of this industry in Pennsylvania and like the wood for fixtures and furniture, high grade material with considerable figure and susceptible of taking a polish is largely demanded. Yellow poplar is an exception as it answers in large amounts only for white enameled finish and is desired because it holds its shape, takes paint readily, and is moderately strong. Birch is probably equally suitable except that it is more liable to warp, but this is overcome in the superior advantages it offers in being stronger and affording a higher polish. White and red oak, including considerable quartered stock, cherry, mahogany, ash, and sweet birch used for exterior work are the woods selected for figure and are finished natural with wax or varnish. Chestnut in some states was reported among these woods but in Pennsylvania where it is extensively cut, the manufacturers of plumbing woodwork made no mention of it. This industry does not depend largely upon the forests of the State as the manufacturers report only 15 per cent. of all the wood they used as State-grown.

Table 83.—Wood for Plumbers' Woodwork, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown In Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>White oak</td>
<td>189,500</td>
<td>12.44%</td>
<td>$48.78</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>131,000</td>
<td>32.84%</td>
<td>30.90</td>
</tr>
<tr>
<td>Ash</td>
<td>175,000</td>
<td>28.52%</td>
<td>35.99</td>
</tr>
<tr>
<td>Birch</td>
<td>65,000</td>
<td>16.25%</td>
<td>20.95</td>
</tr>
<tr>
<td>Red oak</td>
<td>20,000</td>
<td>5.13%</td>
<td>20.00</td>
</tr>
</tbody>
</table>
Table 83—Concluded.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Shortleaf pine,</td>
<td>12,250</td>
<td>2.10</td>
<td>$28.00</td>
</tr>
<tr>
<td>Mahogany,</td>
<td>6,000</td>
<td>1.03</td>
<td>$15.00</td>
</tr>
<tr>
<td>Cherry (black),</td>
<td>4,400</td>
<td>.75</td>
<td>$4.55</td>
</tr>
<tr>
<td>White pine,</td>
<td>3,200</td>
<td>.43</td>
<td>$3.00</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>300</td>
<td>.05</td>
<td>$3.00</td>
</tr>
<tr>
<td>Black walnut,</td>
<td>300</td>
<td>.05</td>
<td>$3.00</td>
</tr>
<tr>
<td><strong>Total,</strong></td>
<td><strong>584,250</strong></td>
<td><strong>100.00</strong></td>
<td><strong>$39.43</strong></td>
</tr>
</tbody>
</table>

INSULATOR PINS AND BRACKETS.

Durability and strength are the requisite qualities of insulator pin material, and locust is the wood principally used in their manufacture. In the country at large, its use for this purpose exceeds seven times the amount of all other woods combined and in Pennsylvania over 425,000 feet are used each year. White oak, red oak, elm, and osage orange are other woods used for pins in various states, but, unlike locust, where these are employed they are ordinarily dipped in paint or some antiseptic solution, such as creosote, in order to increase their durability. In Pennsylvania locust was the only wood reported for insulator pins and the other woods appearing in the table were used for pole brackets.

Table 84.—Wood for Insulator Pins and Brackets, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Locust (black),</td>
<td>463,500</td>
<td>89.12</td>
<td>$23.90</td>
</tr>
<tr>
<td>White oak,</td>
<td>60,000</td>
<td>10.37</td>
<td>$13.33</td>
</tr>
<tr>
<td>Red oak,</td>
<td>55,000</td>
<td>9.91</td>
<td>$11.82</td>
</tr>
<tr>
<td><strong>Total,</strong></td>
<td><strong>578,500</strong></td>
<td><strong>100.00</strong></td>
<td><strong>$21.65</strong></td>
</tr>
</tbody>
</table>

BUTCHERS' BLOCKS AND SKEWERS.

The two important woods for butchers blocks are sycamore and sugar maple. On account of their desired qualities, hardness and uncleavability, together with their strength and tastelessness, they are first among the domestic woods for this use. Formerly butchers' blocks were round, usually
a cross section of a large tree barked and trimmed symmetrically, varying in thickness from 18 to 30 inches. It is exceedingly difficult to season pieces of this size thoroughly and trouble results by blocks checking, rendering it difficult to keep them clean and sanitary. Lately considerable improvement in seasoning processes has partly overcome the only objection to sycamore blocks. The advancement made in the art of gluing woods, which has brought into prominence built-up lumber, has entirely overcome all checking difficulties and enabled the making of blocks lighter in weight but with requisite strength, equally as serviceable and with a more attractive appearance.

The built-up block is the only kind of block being made in Pennsylvania, and sugar maple is the wood used. The size of the pieces that are glued differ slightly according to the dimensions of the finished block but most commonly they are 3 inches thick, 4 inches wide, and 16 to 18 inches long. It is very important that the lumber for the blocks be thoroughly seasoned and to bring it to the desired condition both air and kiln-drying methods are used. Before gluing the pieces together, they are jointed by machinery in order that they fit perfectly, leaving no apertures along edges for glue to collect and thus taint the meat. That they may more readily adhere to the glue the smooth flat surfaces are roughened. This process is important since the rough usage given the meat block brings great strain on the glued joints which must be as strong as it is possible for the best glue to make them. The flat glue joint is used and to weld the pieces together after being heated and covered with glue, they are subjected for 12 or 14 hours to the pressure of a hydraulic machine. They are then bored for several iron rods that are added as a reinforcement for the glued joints. The legs are made usually of the same kind of wood as the meat blocks, namely, maple, but sometimes red oak is used.

Hickory and white pine are the principal woods used for skewers. Those made from the latter wood are employed in kitchens for holding in shape croquettes and other dainties and by confectioners for taffy sticks. Hickory skewers were made to meet the demand of the butchers. Beech and maple are prominent for meat skewers but none were reported by the manufacturers in Pennsylvania where these woods are common lumber trees.

Table 85.—Wood for Butchers' Blocks and Skewers, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft. at factory</th>
<th>Total cost f.o.b. factory</th>
<th>Grown In Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>270,000</td>
<td>5.92</td>
<td>$20.37</td>
<td>5,500</td>
<td>270,000</td>
</tr>
<tr>
<td>White pine,</td>
<td>200,000</td>
<td>38.46</td>
<td>22.00</td>
<td>4,100</td>
<td>200,000</td>
</tr>
<tr>
<td>Hickory,</td>
<td>20,000</td>
<td>9.62</td>
<td>13.00</td>
<td>900</td>
<td>20,000</td>
</tr>
<tr>
<td>Total,</td>
<td>520,000</td>
<td>100.00</td>
<td>$20.77</td>
<td>$10,800</td>
<td>520,000</td>
</tr>
</tbody>
</table>
WEIGHING APPARATUS.

This industry as measured by the consumption of wood is one of the small ones of this report. It includes material for scale manufacture such as is used by railroads, called track scales and hay wagon scales, often used in coal yards, besides platform and counter scales for stores, warehouses, and cabinet scales such as are used for compounding medicines, weighing gold, silver, and precious stones.

Longleaf pine is the most common wood for large scales on account of its durability, strength, and elasticity. It goes principally into the framework of track and wagon scales and was shipped to Pennsylvania from the Gulf states. Sugar maple is next in quantity answering more for the counter and platform scales than any other use because, being hard, tough, strong, and close grained with a tendency to wear smooth, it is specially adapted for this purpose. The handsome finish of mahogany and cherry, together with their compact structure, and the property of holding their shape, commend them for use as material for making the basal parts of cabinet scales and for the frame of the glass cases usually enclosing these scales.

Table 86.—Wood for Weighing Apparatus, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td></td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Longleaf pine,</td>
<td>390,000</td>
<td>50.84</td>
<td>$30.00</td>
<td>$6,000</td>
<td></td>
<td>200,000</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>171,000</td>
<td>22.47</td>
<td>$32.12</td>
<td>5,665</td>
<td>21,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Yellow poplar,</td>
<td>10,000</td>
<td>1.35</td>
<td>$35.00</td>
<td>250</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Cherry (black),</td>
<td>7,500</td>
<td>1.00</td>
<td>$37.00</td>
<td>292</td>
<td>7,500</td>
<td></td>
</tr>
<tr>
<td>Mahogany,</td>
<td>4,000</td>
<td>0.50</td>
<td>$39.00</td>
<td>300</td>
<td>4,000</td>
<td></td>
</tr>
<tr>
<td>Ash</td>
<td>900</td>
<td>1.23</td>
<td>$39.96</td>
<td>84</td>
<td>900</td>
<td>900</td>
</tr>
<tr>
<td>Total</td>
<td>393,400</td>
<td>100.00</td>
<td>$31.93</td>
<td>$12,561</td>
<td>39,400</td>
<td>354,000</td>
</tr>
</tbody>
</table>

PROFESSIONAL AND SCIENTIFIC INSTRUMENTS.

The amount of lumber used by this industry is relatively very small, but the products grouped under it are numerous and vary according to the uses they serve in the several trades or professions included. In the quantity of wood used the pencil makers are the most important class. Similar to the pencil manufacturers in New Jersey, New York, and other states, they report using only one wood, red cedar, which is brought to Pennsylvania from the southern states. Tennessee and Florida are at present the centers of production of this wood. Other kinds, both domestic and foreign, have been considered as possible substitutes because of the growing scarcity of red cedar, but the experiments indicate that only a few species have been found fairly successful and these answer mostly for a cheap pencil. This brings out how difficult it is to find a wood combining all the qualities requisite for pencil material and how essential it is that pencil woods possess qualities almost identical to red cedar. Pencil makers procure their raw material in the form of slats that are usually 2½ inches wide and 7 inches
long, and \( \frac{3}{4} \) inch thick. Not frequently the pencil makers manufacture their own slats, but there are concerns specializing in cedar products who convert their best material into pencil slats and the remainder into lumber for utility boxes, furniture squares, and closet linings. Formerly when cedar was abundant pencil slats were manufactured entirely from logs, but rapidly decreasing supply of cedar timber has brought into the market old stumps, fence rails, gate posts, barn and cabin logs, and material in various shapes and condition, even partly decayed and weather checked. As can be expected, therefore, waste incident to the sawing of pencil slats is large and has been estimated to be about four-fifths of the original amount purchased. A pencil slat makes six half-pencils. The same operation that grooves them to accommodate the lead also gives them their final form and the corresponding halves are identically made from another slat and glued together.

Carpenters' tools belong to this industry. They include commodities made almost entirely of wood such as spirit levels, rules, gauges, mallet heads, level boards, etc. Tools part wood and part metal like screwdrivers, chisels, gimlets, etc., have been grouped under the handle industry. White oak alone met the demand for gauges which require a hard dense light colored wood and from the price given only the best grades were used. In other States boxwood and sugar maple were also used but neither kind was reported in Pennsylvania. White ash and mahogany, because most stable when in place, answered for spirit levels and plumbs. In Connecticut and New Jersey, where a quantity of these commodities are made, cherry is an important wood and large quantities are used. Level boards were entirely of white pine, while for mallets a variety of woods is used. For carpenters' and tinners' mallets sugar maple answered while lignum-vitae, shipped from Mexico, and dogwood served for bung starters and coppersmiths' mallets. Heads of mauls used by sheet metal workers are made of black or sour gum and it is interesting to note that recently this wood has begun to replace sugar maple for this use. Its interlaced fiber, which prevents it from splitting, commends it, besides it is cheap and owing to the large dimensions the trees attain the bolts can readily be had in desired sizes.

In Pennsylvania, as in other states, boxwood is the principal rule material, both for mechanics' collapsible rules and office rulers. It is shipped to this country usually from Turkey or other Mediterranean countries, and owing to its hardness, light color, and stability, it is preferred to any other wood for this commodity. The same qualities commends it to the makers of draftsmen's scales, such as straight-edges, triangles, graduated and slide rules.

Camera makers report using three woods,—mahogany, cherry, and yellow poplar. The first two are the important ones, being strong, close-grained, and free from warping tendencies as well as ornamental. Yellow poplar is used in only relatively small amounts in this line of work and when so demanded goes principally into kits. Ebony was the highest priced wood shown in the table and was reported by the makers of drafting instruments.
### Table 87.—Wood for Professional and Scientific Instruments, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity (Feet b. m.)</th>
<th>Per cent.</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost $ t. o. h. factory.</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red cedar</td>
<td>240,000</td>
<td>73.52</td>
<td>$62.00</td>
<td>$12,480</td>
<td>240,000</td>
<td></td>
</tr>
<tr>
<td>Ash</td>
<td>15,400</td>
<td>5.02</td>
<td>78.78</td>
<td>1,400</td>
<td>15,400</td>
<td></td>
</tr>
<tr>
<td>Black gum</td>
<td>12,000</td>
<td>3.68</td>
<td>56.67</td>
<td>880</td>
<td>12,000</td>
<td></td>
</tr>
<tr>
<td>Cherry (Blacks)</td>
<td>10,000</td>
<td>3.06</td>
<td>100.00</td>
<td>1,000</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>White oak</td>
<td>10,000</td>
<td>3.06</td>
<td>55.00</td>
<td>560</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Dogwood</td>
<td>7,500</td>
<td>2.21</td>
<td>39.47</td>
<td>297</td>
<td>7,500</td>
<td>1,000</td>
</tr>
<tr>
<td>Mahogany</td>
<td>5,118</td>
<td>1.57</td>
<td>109.21</td>
<td>668</td>
<td>5,118</td>
<td>5,118</td>
</tr>
<tr>
<td>Sugar pine</td>
<td>15,000</td>
<td>1.53</td>
<td>70.00</td>
<td>1,000</td>
<td>15,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Boxwood (West Indian)</td>
<td>2,500</td>
<td>7.00</td>
<td>64.00</td>
<td>155</td>
<td>2,500</td>
<td>2,500</td>
</tr>
<tr>
<td>Lignum-vitae</td>
<td>1,000</td>
<td>31.00</td>
<td>120.00</td>
<td>120</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>White pine</td>
<td>1,000</td>
<td>31.00</td>
<td>90.00</td>
<td>90</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Sugar maple</td>
<td>250</td>
<td>12.50</td>
<td>40.00</td>
<td>37</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Ebony</td>
<td>500</td>
<td>15.00</td>
<td>200.00</td>
<td>150</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Total</td>
<td>256,448</td>
<td>100.00</td>
<td>$57.44</td>
<td>$13,700</td>
<td>256,448</td>
<td>337,948</td>
</tr>
</tbody>
</table>

**Pulleys and Conveyors.**

The commodities grouped in this industry are tackle blocks, belt pulleys, conveyors, and clutches, and thirteen kinds of wood are used for making them. Metal has to a large extent replaced wood in this line of manufacture, but studies similar to this in various states have shown that a considerable quantity of wood is still demanded for making them. For belt pulley rims the manufacturers in Pennsylvania call for birch, basswood, yellow poplar, cucumber, cottonwood, and butternut, and for the center arms, red oak, white oak, sugar maple, ash, and beech.

Tackle block material must be dense, hard, strong, tough, and most difficult to split. White ash, sugar maple, and a small amount of black gum are the woods reported in use in Pennsylvania though in other states elm is frequently used. Pulley blocks are of many types and sizes in order to meet a variety of uses. For example, those required on vessels, in building construction, in mines, on derricks and hoists by house painters, masons, carpenters, etc., range from a snatch block to the multiple pulley blocks. The latter is usually of the shoulder block type and designed for one or more sheaves. It is sometimes chambered out to receive a wheel in each compartment while at other times two or more wheels are placed side by side in a section. The old time block maker did much of the work by hand, but the improved machinery in recent years does the work with greater accuracy and in much less time. The lumber is ripped into dimensions the width of the block and the reciprocating saw then cuts the dimensions into shape, when they are passed on to be mortised. Often the wheel slats are cut by machinery and then the blocks are ready for the sheaves.

A small part of this industry consists in the manufacture of conveyors such as are used in factory elevators and warehouses to carry merchandise and grain. These require only a limited amount of wood for small parts and white oak and sugar maple are the species reported.
Fig. 30 — Interior of excelsior factory, showing billets in place in excelsior machines.

Fig. 31.—Finished excelsior ready for baling.
Fig. 32.—Whips, canes, and umbrella handles, and rough stock from which they are manufactured.
DESCRIPTION OF FIGURE 32.

1. Butt cut seedling and umbrella handle—sweet birch.
2. Cut of seedling and cane—osage orange.
4. Whangee cuts, one bent ready to be cut into cane length.
5. Three designs of weichsel umbrella handles.
6. Butt-cut of furze, 1 parasol and 2 umbrella handles.
7. Malacca (rattan) cut and cane.
8. Butt cut seedling, umbrella handle and cane—partridge.
9. Rough sawn billet, parasol handle and cane—holly.
11. Rough sawn billet, umbrella handle and cane—applewood.
12. Two parasol and one umbrella handle—ebony.
15. Corra cane with rice-root handle.
16. Rice-root from which handle of 15 was made.
17. Cut of Congo and umbrella handle.
18. Cut of Scotch thistle and parasol handle.
20. Rough sawn billet, cane, umbrella and 4 parasol handle—sugar maple.
23. Two butt-cut seedlings and umbrella handle—hickory.
24. Cut of lancewood and umbrella handle.
25. Morillo cherry (sweet cherry) parasol handle.
27. Red oak (Jersey)—parasol handle.

Cuts of white thorn and bamboo unnumbered, at bottom of illustration.
Fig. 33.—Manufacturer of shoe lasts. Roughly cut billets and the finished lasts turned from them.

Fig. 34.—Evolution of a shoe last.
Table 88.—Wood for Pulleys and Conveyors, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Per cent.</th>
<th>Average cost per 1,000 ft. at factory</th>
<th>Total cost f. o. b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td></td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>39,000</td>
<td>27.16</td>
<td>$28.75</td>
<td>$2,340</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>60,000</td>
<td>43.05</td>
<td>$29.65</td>
<td>2,970</td>
<td>50,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Basswood</td>
<td>40,000</td>
<td>33.78</td>
<td>$30.00</td>
<td>800</td>
<td>40,000</td>
<td></td>
</tr>
<tr>
<td>Ash</td>
<td>13,000</td>
<td>5.09</td>
<td>20.00</td>
<td>430</td>
<td>7,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Beech</td>
<td>15,000</td>
<td>5.09</td>
<td>20.00</td>
<td>300</td>
<td>15,000</td>
<td></td>
</tr>
<tr>
<td>Black gum</td>
<td>14,000</td>
<td>4.75</td>
<td>23.71</td>
<td>472</td>
<td>14,000</td>
<td></td>
</tr>
<tr>
<td>White oak</td>
<td>15,000</td>
<td>5.09</td>
<td>20.00</td>
<td>325</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Birch</td>
<td>10,000</td>
<td>3.40</td>
<td>15.00</td>
<td>250</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Red oak</td>
<td>10,000</td>
<td>3.40</td>
<td>14.00</td>
<td>140</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Red and silver maple</td>
<td>10,000</td>
<td>3.40</td>
<td>13.00</td>
<td>10,000</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Cucumber</td>
<td>15,000</td>
<td>5.09</td>
<td>20.00</td>
<td>200</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Butternut</td>
<td>10,000</td>
<td>3.40</td>
<td>10.00</td>
<td>200</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Cottonwood</td>
<td>2,000</td>
<td>.65</td>
<td>42.00</td>
<td>42</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>294,500</td>
<td>100.00</td>
<td>$29.30</td>
<td>$8,629</td>
<td>200,500</td>
<td>94,000</td>
</tr>
</tbody>
</table>

BOOT AND SHOE FINDINGS.

Nearly all shoes in the United States are made over wooden lasts and, therefore, the manufacture of these lasts as well as other shoe findings is an important enterprise. In comparison with the quantity of woods consumed in other states, particularly Massachusetts, Michigan, New Hampshire, and New York, this industry in Pennsylvania is relatively small; but because of the substantial well equipped establishments, of the skilled labor employed, and in the high grade of products manufactured, it is of considerable industrial importance. Lasts, shoe forms, and wood soles are the commodities to which the statistics in Table 89 refer.

Lasts are made from sugar maple and persimmon because they possess the essential qualities of hardness, density, capacity for smooth finish, and permanence in final shape. No other domestic woods have been found equally suitable. The former goes into lasts, all sizes and kinds, both for leather and rubber shoes, and the latter for the better grades of children's and misses' sizes. Considering the great number of shoes made in this country, comparatively few lasts are needed as many pairs are made over the same pattern. The wear on the last is considerable and it can be used steadily for no longer than twelve to fifteen months. For that reason only the high grade select wood is required.

There are two distinct divisions of the last industry,—the manufacture of the last block from bolts, and the manufacture of the finished last from the rough turned blocks. The industry in Pennsylvania covers only the manufacture of the latter and the fact that no last and filler blocks were found being made in the State, though maple and basswood are commonly cut in Pennsylvania, explains the fact that the entire amount of wood used by the last makers was reported as coming from other states.

Last block manufacture entails various difficulties in kiln-drying and many who have started the business have failed. Those who have mastered the obstacles and acquired efficient processes of seasoning manufacture on a
large scale and therefore reduce the number of block factories many times below the number of the last makers. Last blocks are split from bolts winter cut and then rough turned to various sizes on machines usually of special design. The seasoning begins after the blocks are turned. First, they are air-dried about twelve months after they are placed on racks under sheds. The seasoning is completed by means of dry kilns and for this a period, approximately three months, is required when the block is ready to send to the last maker.

Shoe trees, to be inserted into shoes to hold the shape, are an important part of this industry but none are manufactured in Pennsylvania. Formerly they were made solid of wood and were expensive. The best are still so made; but recently, by the introduction of a combination tree of steel bands and wood blocks, it has been made possible to make them to sell at a nominal cost.

Basswood is used as exclusively for forms or fillers as is sugar maple for lasts. Forms are turned similarly from rough turned blocks. They are used to maintain the natural shape of the shoe in samples displayed in show cases and when being handled by traveling salesmen. They fit the shoes perfectly and give an effect similar to the appearance of the shoe on the foot. Fillers should be light in weight to save cost in transportation in salesmen's trunks. To reduce weight to the minimum many are hollowed, and basswood being soft, easily worked, light, and sufficiently tough, holding its shape well, is the most practical wood to use. The growing high cost of basswood has made a demand for a suitable substitute at a lower price but as yet none has been found.

Clog or wooden soled shoes have leather tops and are used by people working in wet and cold places, such as breweries, tanneries, creameries, mines, dye works, fish canneries, slaughter houses, paper mills, also in foundries and metal works, and by others who desire a very durable shoe at a reasonable price. High grades of yellow poplar and basswood are the materials demanded for clog soles in Pennsylvania, but in Illinois, Michigan, and Kentucky, beech, maple, and basswood in the order named contributed the material.

Table 89.—Wood for Boot and Shoe Findings, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Per cent</th>
<th>Average cost per 1,000 ft. at factory</th>
<th>Total cost f. &amp; o. b. factory</th>
<th>Feet b. m.</th>
<th>Feet b. m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar maple</td>
<td>100,500</td>
<td>37.92</td>
<td>$35.86</td>
<td>$5,414</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persimmon</td>
<td>99,000</td>
<td>37.36</td>
<td>$36.19</td>
<td>$5,569</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basswood</td>
<td>25,500</td>
<td>12.14</td>
<td>$50.72</td>
<td>$1,580</td>
<td>18,000</td>
<td>17,500</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>30,000</td>
<td>11.32</td>
<td>$56.67</td>
<td>$1,700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>255,000</td>
<td>100.00</td>
<td>$56.53</td>
<td>$14,875</td>
<td>38,000</td>
<td>247,000</td>
</tr>
</tbody>
</table>
SMOKING PIPES.

Pennsylvania leads all other states in the consumption of wood for smoking pipes. Five woods supply the raw material for this line of manufacture; two of them are foreign species. Applewood leads the list as to amount, and is the only wood reported cut in the State. The best grades of pipes are made from French briar, ebony, and rosewood, but the last named was not reported in Pennsylvania. The sapwood of sweet or cherry birch and red gum is used for cheap pipes, the former to imitate calabash and the latter rosewood. Olivewood pipes resemble meerschaum when finished.

Table 90.—Wood for Tobacco Pipes, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>Average cost per 1,000 ft.</td>
</tr>
<tr>
<td>Applewood,</td>
<td>131,435</td>
<td>53.38</td>
<td>$52.42</td>
</tr>
<tr>
<td>French briar,</td>
<td>81,800</td>
<td>35.90</td>
<td>$53.34</td>
</tr>
<tr>
<td>Red gum,</td>
<td>12,000</td>
<td>5.27</td>
<td>50.00</td>
</tr>
<tr>
<td>Ebony,</td>
<td>9,800</td>
<td>4.31</td>
<td>183.67</td>
</tr>
<tr>
<td>Birch,</td>
<td>2,000</td>
<td>.88</td>
<td>50.00</td>
</tr>
<tr>
<td>Olive wood,</td>
<td>450</td>
<td>.21</td>
<td>81.25</td>
</tr>
<tr>
<td>Total,</td>
<td>227,615</td>
<td>100.00</td>
<td>$165.49</td>
</tr>
</tbody>
</table>

SPORING AND ATHLETIC GOODS.

Ash, on account of its strength and convenient weight, is probably the premier wood for baseball bats. The entire amount listed in Table 91 went for this use, and most of it was purchased in the form of squares, usually 3 inches by 3 inches by 38 inches long. In other states bat manufacturers used several woods, the principal ones other than ash being hickory, willow, beech, ironwood, and maple. Though all of these are trees indigenous to Pennsylvania, and the wood easily obtained, the manufacturers in this State did not report the use of any.

Twice as much beech was used for game traps as any other wood and its strength and density especially favor it for this purpose. Hard maple, its chief competitor, with small quantities of ash and birch supplied the rest of the material, purchased in the form of surfaced lumber. All used was cut in the State.

Sugar maple, hard, tough, close grained, easily turned, has proved the best qualified wood for duck and ten pins. The quantity used in Pennsylvania is somewhat disappointing considering the large quantity of pins sold. Information was secured of a large number of duck pin squares being cut in the State, but they were shipped elsewhere to be manufactured and doubtless are sent back to be sold in the finished product. Lignum-vitae answered for bowling balls and, though a composition ball resembling hard rubber is being more generally used, the best bowlers prefer the wooden ball. Lignum-vitae is the highest priced wood shown in the table and is bought in the form of bolts shipped from the West Indies. No domestic wood possesses the com-
bined qualities for balls equal to lignum-vitae. It is very heavy, hard, dense, strong, and keeps its shape. Dogwood is the nearest approach and is used to a limited extent but is not durable. None was reported in Pennsylvania.

Sugar maple and longleaf pine are the most used woods for bowling alleys. The latter wood, edge grain and best grade, is used for the bed of the alley, and the former for the approach and pin spot end and also for the return track. Spruce or longleaf pine are the best for the gutters, and for the buffer frames and sheathing shortleaf pine and hemlock were called for.

Pool and billiard tables and shuffle boards account for the rest of the woods not mentioned above which are listed in the table. Chestnut and yellow poplar answers for frames of pool and billiard tables, red oak, white oak, ash, and sugar maple for the legs and also for sides and bodies. Cherry went into triangles for setting pool balls and maple was the only wood for cues.

Table 91.—Wood for Sporting and Athletic Goods, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Total cost f. a. b.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>97,500</td>
<td>$3,524</td>
<td>47,500</td>
</tr>
<tr>
<td>White oak,</td>
<td>41,500</td>
<td>1,188</td>
<td>21,000</td>
</tr>
<tr>
<td>Ash,</td>
<td>90,000</td>
<td>2,005</td>
<td>20,000</td>
</tr>
<tr>
<td>Beech,</td>
<td>20,000</td>
<td>815</td>
<td></td>
</tr>
<tr>
<td>Cottonwood,</td>
<td>10,000</td>
<td>839</td>
<td>10,000</td>
</tr>
<tr>
<td>Chestnut,</td>
<td>19,000</td>
<td>350</td>
<td>5,000</td>
</tr>
<tr>
<td>Yellow poplar,</td>
<td>5,000</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Lignum-vitae,</td>
<td>550</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>Red oak,</td>
<td>500</td>
<td>17</td>
<td>500</td>
</tr>
<tr>
<td>Cherry (black),</td>
<td>100</td>
<td>65</td>
<td>500</td>
</tr>
<tr>
<td>Total</td>
<td>215,100</td>
<td>$8,339</td>
<td>135,100</td>
</tr>
</tbody>
</table>

SADDLES AND HARNESS.

Hames are the principal commodity included in the following table. They require a tough, strong, close wood. Ash and white oak furnished the largest portion of the supply of raw material in Pennsylvania, which was purchased in the form of squares of various sizes, the principal sizes being 2 inches by 2 inches, 3 inches long, and 2 inches by 2 inches, 32 inches long. White ash was the favorite as to quantity. Black ash and hickory, though used, contributed but small amounts. Pennsylvania is the first state in which hickory has been reported by hame manufacturers though it has for a long time been used by farmers for hand-made hames. According to reports from factories in other states, ironwood, sugar maple, beech, white elm, and red oak are suitable hame materials though their use was not reported in large quantities.

White ash was the only wood called for in Pennsylvania for making saddle trees, which is the only product except hames classed under this heading. From other similar state reports, ash, though adaptable, is an unimportant wood for this use. The kinds most used named in the order of quantity and selected because of the quality of toughness with requisite weight are: White
elm, cottonwood, sycamore, soft maple, white oak, ash, hackberry, and basswood.

Table 92.—Wood for Saddles and Harness, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Ash</td>
<td>188,000</td>
<td>100.00</td>
<td>$44 80</td>
<td>$4,808</td>
<td>78,000</td>
</tr>
<tr>
<td>White oak</td>
<td>78,000</td>
<td>52.19</td>
<td>$44 60</td>
<td>$4,560</td>
<td>40,000</td>
</tr>
<tr>
<td>Hickory</td>
<td>10,000</td>
<td>6.32</td>
<td>$00 00</td>
<td>000</td>
<td>10,000</td>
</tr>
<tr>
<td>Red oak</td>
<td>8,000</td>
<td>4.26</td>
<td>$00 00</td>
<td>000</td>
<td>6,000</td>
</tr>
<tr>
<td>Total</td>
<td>188,000</td>
<td>100.00</td>
<td>$55 32</td>
<td>$10,400</td>
<td>136,000</td>
</tr>
</tbody>
</table>

GATES AND FENCING.

Table 93 lists seven woods used in Pennsylvania for fence pickets and gates, both farm gates and those used for the enclosure of front yards and lawns. White cedar, shipped in from the Carolinas, stands first as to quantity and in no other industry was it the principal wood. Its durability in exposed situations especially commends it for this use. Spruce is listed in the table in large quantities and the fact that it was preferred to several State-grown woods that could probably have been obtained cheaper and known to be more durable, is worthy of note. The durable properties of cypress, together with its strength, favor it also as an excellent wood for gate and fencing material. That cypress is demanded for the best lines of work of this character is seen from the fact that it is the only wood reported by railroads for crossing gates. In the lower grades it is popular for lawn fence pickets, for which use it serves with chestnut and white pine. Stubs, the wooden parts of patent woven wire fencing, called for chestnut and white cedar. Though white cedar was used in larger quantities, yet chestnut, because it is cheaper and at the same time possesses lasting qualities for outdoor uses, is destined to grow in favor for this purpose.
Table 93.—Wood for Gates and Fencing, year ending June, 1912.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td></td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Southern white cedar</td>
<td>100,000</td>
<td>61.98</td>
<td>$39.00</td>
<td>$2,000</td>
<td>100,000</td>
<td></td>
</tr>
<tr>
<td>Spruce</td>
<td>36,000</td>
<td>22.31</td>
<td>35.00</td>
<td>990</td>
<td>36,000</td>
<td></td>
</tr>
<tr>
<td>Chestnut</td>
<td>11,500</td>
<td>7.13</td>
<td>35.39</td>
<td>252</td>
<td>6,000</td>
<td></td>
</tr>
<tr>
<td>White pine</td>
<td>5,000</td>
<td>3.10</td>
<td>30.00</td>
<td>110</td>
<td>5,000</td>
<td></td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>5,000</td>
<td>3.10</td>
<td>33.00</td>
<td>120</td>
<td>5,000</td>
<td></td>
</tr>
<tr>
<td>Cypress (bald)</td>
<td>3,849</td>
<td>2.38</td>
<td>55.00</td>
<td>211</td>
<td>3,849</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>161,349</td>
<td>100.00</td>
<td>$32.58</td>
<td>$3,549</td>
<td>16,500</td>
<td>144,849</td>
</tr>
</tbody>
</table>

CLOCK CASES.

In the quantity of wood consumed, the manufacture of clock cases in Pennsylvania is one of the minor industries. However, since wood is only one of a number of materials required, it is not a fair basis for comparison. Clock makers report the use of lumber for mantel and wall clocks, and to a limited extent for large hall and grandfather clocks. Mahogany is the principal wood used and represents over 50 per cent of the total. This is the only industry in which an imported wood leads the list of species. Next to mahogany, the oaks were in the largest demand for the exterior work of wall clocks finished natural or darkened by fumes or stain to produce the mission effects.

The backs of cases of all kinds and the bottoms of mantel clocks are not visible and are therefore made of cheaper wood. Yellow poplar and basswood met this demand because they hold their shape and are easy to work and nail. Yellow poplar is also called on to a limited extent for the base or backing of enameled work. The art of enameling wood has made rapid progress of late years and limitations are made not only to resemble foreign woods but also marble and other materials.

Veneer takes a prominent place in this industry, both as a finish and as layers in 3-ply built-up stock used in making clock cases. The appearance of chestnut and yellow poplar in the table is accounted for in this form. In regard to the price shown for red gum, it should be noted that it was used for finish or exterior work and as it is frequently found beautifully modeled with figure and color similar to Circassian walnut it furnishes a substitute for that wood for finish.
Table 94.—Wood for Clocks, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Per cent.</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory.</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td></td>
<td></td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Mahogany</td>
<td>43,000</td>
<td>20.53</td>
<td>$102.84</td>
<td>$4,465</td>
<td>43,000</td>
<td>35,000</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>35,000</td>
<td>17.35</td>
<td>83.57</td>
<td>1,175</td>
<td>35,000</td>
<td>35,000</td>
</tr>
<tr>
<td>Black walnut</td>
<td>21,000</td>
<td>9.96</td>
<td>74.30</td>
<td>1,970</td>
<td>21,000</td>
<td>21,000</td>
</tr>
<tr>
<td>White oak</td>
<td>13,500</td>
<td>6.38</td>
<td>60.00</td>
<td>800</td>
<td>13,500</td>
<td>13,500</td>
</tr>
<tr>
<td>Red gum</td>
<td>10,000</td>
<td>4.67</td>
<td>40.00</td>
<td>400</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Chestnut</td>
<td>5,000</td>
<td>2.35</td>
<td>30.00</td>
<td>150</td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Basswood</td>
<td>5,000</td>
<td>2.35</td>
<td>60.00</td>
<td>300</td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Birch</td>
<td>4,000</td>
<td>1.87</td>
<td>45.00</td>
<td>180</td>
<td>4,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Red oak</td>
<td>3,000</td>
<td>1.35</td>
<td>45.00</td>
<td>135</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Total</td>
<td>139,000</td>
<td>100.00</td>
<td>$65.08</td>
<td>$9,675</td>
<td>139,000</td>
<td>139,000</td>
</tr>
</tbody>
</table>

**ROLLERS AND POLES.**

Window shade rollers belong to this industry but none are manufactured in Pennsylvania, though sawmills cutting white pine were found furnishing large quantities of material in the desired form to the New York shade roller makers. Curtain poles and brackets, rug and drugget poles, and awning rollers are the articles to which the statistics in Table 95 refer. Basswood is the leading wood and it went entirely into curtain poles. It serves well for this use, first, because it is so easily worked, and second, the ease and permanence with which it takes paint and stain allows it to be finished to imitate expensive hardwoods like walnut, mahogany, and oak. Hard maple, sweet birch, white oak, and white ash are other important curtain pole woods and the ones reported mainly for curtain pole fixtures and brackets.

Rug and drugget pole manufacturers called principally for black gum, but beech, basswood, and yellow poplar met part of the demand. Awning rollers require a heavy wood. Sugar maple, hickory, beech, and black gum were the ones reported. The two former, being expensive, were used in small quantities only. Black gum is practically a new wood for this use but the demand is increasing owing to its being one of the cheapest hardwoods with the requisite weight, strength, and adaptability for being turned. Redwood was the only wood reported for shade hangers.
Table 95.—Wood for Rollers and Curtain Poles, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft. at factory</th>
<th>Total cost at o. b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td></td>
<td></td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>Basswood,</td>
<td>37,000</td>
<td>29.86</td>
<td>$30.00</td>
<td>$750</td>
<td>37,500</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>27,425</td>
<td>21.84</td>
<td>16.69</td>
<td>455</td>
<td>27,000</td>
</tr>
<tr>
<td>White oak,</td>
<td>27,000</td>
<td>15.13</td>
<td>16.62</td>
<td>316</td>
<td>19,000</td>
</tr>
<tr>
<td>Beech,</td>
<td>12,000</td>
<td>9.58</td>
<td>14.00</td>
<td>168</td>
<td>12,000</td>
</tr>
<tr>
<td>Birch,</td>
<td>12,000</td>
<td>9.58</td>
<td>14.00</td>
<td>168</td>
<td>12,000</td>
</tr>
<tr>
<td>Ash,</td>
<td>6,150</td>
<td>4.99</td>
<td>32.65</td>
<td>201</td>
<td>5,000</td>
</tr>
<tr>
<td>Black gum,</td>
<td>5,000</td>
<td>4.25</td>
<td>20.00</td>
<td>120</td>
<td>6,000</td>
</tr>
<tr>
<td>Hickory,</td>
<td>2,500</td>
<td>1.99</td>
<td>60.00</td>
<td>150</td>
<td>2,500</td>
</tr>
<tr>
<td>Redwood,</td>
<td>2,000</td>
<td>1.59</td>
<td>45.00</td>
<td>90</td>
<td>2,000</td>
</tr>
<tr>
<td>Yellow poplar,</td>
<td>1,000</td>
<td>0.79</td>
<td>65.00</td>
<td>65</td>
<td>1,000</td>
</tr>
<tr>
<td>Total,</td>
<td>125,675</td>
<td>100.00</td>
<td>$19.77</td>
<td>$2,483</td>
<td>115,000</td>
</tr>
</tbody>
</table>

MANUAL TRAINING PRACTICE.

Improved systems of public school education today endeavor to give not only a thorough grounding in the usual elementary subjects but also offer opportunities to acquire the fundamentals of various artisan trades by methods of practical work in the laboratory, the shop, or the field. These specialized schools or departments are known as “Manual Training” and in connection with the excellent system of public education in Pennsylvania there has been established a large number of them throughout the State. They offer instruction in a diversity of practical courses. Important among these is wood craft. Shops equipped with tools of all kinds and with wood-working machinery afford training in the making of many kinds of commodities and an insight into all lines and processes of wood-working. Woods that are soft and possess properties to work easily are naturally the kinds in greatest demand. That white pine, yellow poplar, and basswood head the list in Table 96, therefore, is not surprising, but that so small amounts of yellow pine and hemlock are employed, these being the cheapest woods, is interesting, especially as these woods are important in many wood manufacturing industries. If both the red and white oaks had been compiled under one heading, oak, this wood would have been first in the table. Of the twenty species used, mahogany is the highest priced and beech the lowest.
Fig. 36.—Evolution of a gun stock and a number of finished stocks ready for market, made of black and Circassian walnut.
Table 96.—Wood for Manual Training Practice, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td>$/t</td>
<td>$/t</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>White pine,</td>
<td>21,575</td>
<td>22.49</td>
<td>$72.35</td>
<td>$1,561</td>
<td>8,675</td>
</tr>
<tr>
<td>Yellow poplar,</td>
<td>16,350</td>
<td>33.64</td>
<td>$65.65</td>
<td>$1,068</td>
<td>9,550</td>
</tr>
<tr>
<td>Basswood,</td>
<td>14,100</td>
<td>45.05</td>
<td>$43.60</td>
<td>$590</td>
<td>7,650</td>
</tr>
<tr>
<td>Red oak,</td>
<td>13,670</td>
<td>13.62</td>
<td>$72.61</td>
<td>$940</td>
<td>9,070</td>
</tr>
<tr>
<td>White oak,</td>
<td>10,500</td>
<td>10.94</td>
<td>$83.81</td>
<td>$881</td>
<td>4,950</td>
</tr>
<tr>
<td>Chestnut,</td>
<td>7,000</td>
<td>7.30</td>
<td>$64.14</td>
<td>448</td>
<td>5,000</td>
</tr>
<tr>
<td>Sugar maple,</td>
<td>6,350</td>
<td>3.49</td>
<td>$50.43</td>
<td>163</td>
<td>3,850</td>
</tr>
<tr>
<td>Cherry (black),</td>
<td>1,350</td>
<td>1.29</td>
<td>$55.68</td>
<td>103</td>
<td>1,150</td>
</tr>
<tr>
<td>Cypress (bald),</td>
<td>1,750</td>
<td>1.52</td>
<td>$63.45</td>
<td>111</td>
<td>500</td>
</tr>
<tr>
<td>Ash,</td>
<td>1,100</td>
<td>1.15</td>
<td>$70.91</td>
<td>78</td>
<td>300</td>
</tr>
<tr>
<td>Hickory,</td>
<td>930</td>
<td>.97</td>
<td>$70.66</td>
<td>64</td>
<td>234</td>
</tr>
<tr>
<td>Black walnut,</td>
<td>850</td>
<td>.89</td>
<td>$87.06</td>
<td>77</td>
<td>650</td>
</tr>
<tr>
<td>Mahogany,</td>
<td>750</td>
<td>.78</td>
<td>$84.67</td>
<td>101</td>
<td>1,150</td>
</tr>
<tr>
<td>Beech,</td>
<td>600</td>
<td>.62</td>
<td>$28.33</td>
<td>17</td>
<td>600</td>
</tr>
<tr>
<td>Sugar pine,</td>
<td>500</td>
<td>.52</td>
<td>$50.00</td>
<td>40</td>
<td>500</td>
</tr>
<tr>
<td>Red gum,</td>
<td>470</td>
<td>.49</td>
<td>$72.24</td>
<td>34</td>
<td>470</td>
</tr>
<tr>
<td>Red cedar,</td>
<td>400</td>
<td>.42</td>
<td>$97.56</td>
<td>39</td>
<td>400</td>
</tr>
<tr>
<td>Hemlock,</td>
<td>262</td>
<td>.52</td>
<td>$34.35</td>
<td>9</td>
<td>262</td>
</tr>
<tr>
<td>Shortleaf pine,</td>
<td>250</td>
<td>.26</td>
<td>$40.06</td>
<td>10</td>
<td>250</td>
</tr>
<tr>
<td>Redwood,</td>
<td>50</td>
<td>.05</td>
<td>$60.00</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>Dogwood,</td>
<td>34</td>
<td>.04</td>
<td>$90.00</td>
<td>3</td>
<td>34</td>
</tr>
<tr>
<td>Total,</td>
<td>95,545</td>
<td>100.00</td>
<td>$55.44</td>
<td>$5,275</td>
<td>51,875</td>
</tr>
</tbody>
</table>

MISCELLANEOUS.

In soliciting information from the various manufacturers concerning the extent of their operations in the consumption of wood, the Forest Service and the Pennsylvania Department of Forestry made assurance that the data would be treated confidentially and not used in the report so as to reveal the identity of the establishments furnishing it. Whenever, therefore, fewer than three factories making similar commodities were entitled to be grouped as an industry, rather than discard the information from the report it was placed under the head "Miscellaneous."

The nearly seven and a half million feet shown as the total of the table includes considerably over five million of State-grown white pine for matches, more than 100 M feet of beech cut in the State for brewer chips, used in breweries to clarify beer, nearly 200 M feet of white ash, Douglas fir, soft maple, and beech for flag poles and shafts, and nearly one-half that amount consisting of spruce, hemlock, and yellow pine for tent poles. Small quantities of red cedar were used for oil barrel faucets, and black walnut and Circassian walnut for stocks and fore-ends of both fire-arms and of air rifles.
Table 97.—Wood for Miscellaneous, year ending June, 1912.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost f. o. b. factory</th>
<th>Grown in Pennsylvania</th>
<th>Grown Out of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet b. m.</td>
<td>Per cent.</td>
<td></td>
<td>Feet b. m.</td>
<td>Feet b. m.</td>
</tr>
<tr>
<td>White pine</td>
<td>7,002,000</td>
<td>94.41</td>
<td>$16.00</td>
<td>$132,070</td>
<td>7,002,000</td>
</tr>
<tr>
<td>Beech</td>
<td>175,003</td>
<td>2.35</td>
<td>14.86</td>
<td>2,600</td>
<td>175,003</td>
</tr>
<tr>
<td>Red and silver maple</td>
<td>50,000</td>
<td>.67</td>
<td>14.00</td>
<td>760</td>
<td>50,000</td>
</tr>
<tr>
<td>Ash</td>
<td>50,000</td>
<td>.67</td>
<td>25.00</td>
<td>1,250</td>
<td>50,000</td>
</tr>
<tr>
<td>Black walnut</td>
<td>24,260</td>
<td>.46</td>
<td>71.81</td>
<td>2,436</td>
<td>10,290</td>
</tr>
<tr>
<td></td>
<td>10,000</td>
<td>.25</td>
<td>25.00</td>
<td>2,500</td>
<td>24,000</td>
</tr>
<tr>
<td>Birch</td>
<td>25,000</td>
<td>.34</td>
<td>14.00</td>
<td>350</td>
<td>25,000</td>
</tr>
<tr>
<td>Loblolly pine</td>
<td>17,000</td>
<td>.23</td>
<td>29.60</td>
<td>510</td>
<td>17,000</td>
</tr>
<tr>
<td>Douglas fir</td>
<td>14,400</td>
<td>.30</td>
<td>25.00</td>
<td>370</td>
<td>14,400</td>
</tr>
<tr>
<td>Hemlock</td>
<td>12,250</td>
<td>.17</td>
<td>28.15</td>
<td>345</td>
<td>10,000</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>11,500</td>
<td>.16</td>
<td>29.00</td>
<td>235</td>
<td>11,500</td>
</tr>
<tr>
<td>Spruce</td>
<td>10,000</td>
<td>.13</td>
<td>20.00</td>
<td>200</td>
<td>10,000</td>
</tr>
<tr>
<td>Circassian walnut</td>
<td>10,000</td>
<td>.13</td>
<td>13.00</td>
<td>1,300</td>
<td>10,000</td>
</tr>
<tr>
<td>Red cedar</td>
<td>5,000</td>
<td>.07</td>
<td>40.00</td>
<td>200</td>
<td>5,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7,416,553</td>
<td>100.00</td>
<td>$20.00</td>
<td>$193,466</td>
<td>7,333,703</td>
</tr>
</tbody>
</table>

100.00

100.00
PART III.

THE USES OF WOOD BY PENNSYLVANIA MANUFACTURERS.

The following list indicates the various uses of wood reported by Pennsylvania manufacturers. The collation comprises over 6,000 separate commodities, and is probably the most complete statement of this kind ever presented.

APPLEWOOD.

Handles, handsaw

Baskets
Bats, baseball
Beans, plow
Bodies, sleigh
Boxes, comb
Boxes, knife
Boxes, salt
Boxes, tin plate
Box shooks
Cabinets, kitchen
Cabs, locomotive
Chairs, kitchen
Chests, ice
Commodities, interior
Cooperage stock
Covers, butter pall

Crating
Finish, boot
Frames, automobile bodies
Frames, carriage bodies
Frames, wagon bodies
Handles, garden trowel
Handles, hammer
Handles, hand drill
Handles, hoe
Handles, lawn mower
Handles, paint brush
Handles, rake
Handles, wheel hoe
Hoppers, vegetable
Moulding, picture
Pails, candy

BUSHEL CRATES
Cabinets, filing, exterior
Cabinets, printer
Cabinets, special work
Cabinets, typewriter
Cabin, interior, river craft
Cabin, interior, ships
Cabin, interior, yachts
Cabs, locomotive
Carpet strip, house interior trim
Cars, elevator
Cases, binocular
Cases, ship chart
Cases, type
Caging, controller box, electric cars
Casing, door
Casing, pipe organ
Casing, window
Chair arms, railway cars
Chair bottoms
Chair rail, house interior trim
Churn parts
Closets, dumb waiter
Comaing, motor boat
Colonades, house interior trim
Consoles
Corner blocks, house interior trim
Corner posts, light delivery wagons
Costumers
Counter tops, bar room
Covers, hatchway (ship)
Covers, switch boxes (electric cars)
Cues, billiard
Cupboard doors, railway cars
Decking, canoe
Doors
Doors, dumb waiter shaft
Doors, folding
Doors, locker (boat and ship)
Doors, sliding
Drain boards
Drop gate, light delivery wagon bodies
Dumb waiters
Dumb waiter parts

ASH, BLACK.

Pew, church
Poles, pine
Poles, plow
Refrigerators
Seats, auto
Seats, carriage
Sides, cheese box
Slats, bed
Slats, trunk
Sleds, coaster
Tops, cheese box
Tubs, butter
Tubs, yard
Va-boards, laundry
Wood pulleys

ASH, WHITE.

Dust guards (railway passenger cars)
Elevators, grain
Eveners
Facing, window partition (electric cars)
Fellos, heavy vehicle wheels
Fellos, light delivery wagons
Fifth wheel bars, light delivery wagons
Fifth wheel circles, light delivery wagons
Fifth wheel spoons, light delivery wagons
Filters, Scotch bale
Ellet, house interior trim
Finish, interior engine cab
Finish, yacht cabin
Fixtures, office, exterior
Flat battens, house interior trim
Flooring
Flooring, freight car platform seals
Flooring, freight elevators
Flooring, (passenger elevator cars)
Frames, automobile bodies
Frames, bob sleds
Frames, chair
Frames, coal screens
Frames (elevator cars)
Frames, gravel screens
Frames, sand shaking screens
Frames, tennis racket
Framework, automobile cushion
Front panels, light delivery wagons
Grilles (ship and boat cabins)
Guide posts, dumb waiter
Handles, bottom pick
Handles, brush
Handles, clay pick
Handles, coal pick
Handles, collier shovel
Handles, cultivator
Handles, garden hoe
Handles, garden rake
Handles, hay knife
Handles, jack screw
ASH, WHITE—Continued.

Novelties

Nosing, house interior trim
Nuts, raw boat
Panels, automobile bodies
Panels, ceiling (railway cars)
Panels, door
Panels, wagon bodies
Panels, windows, railway cars
Panels, strips, interior house trim
Panel wallwainscoting, railway cars
Paper pulp
Parts, floor mill machinery
Piano cases, veneer
Pilasters, piano
Pilasters, light delivery wagon
Pilot wheels, river craft
Pilot wheels, ship
Pilot wheels, yacht
Planks, fish
Planks, steak
Plate rail, dining room
Pole futchels, light delivery
wagon
Posts, chair
Posts, piano
Posts, wagon
Posts, warehouse trucks
Push cars (bodies)
Rails, display
Rails, magazine
Rails, doors
Rails, guide (dumb waiter)
Rails, river craft
Rails, ship
Rails, stair
Rails, yacht
Reach, buggy
Reach, farm wagon
Reach, lumber wagon
Reach, perch spring wagon
Reach, surrey
Reach, wagon
Rear end posts, light delivery
wagon
Refrigerators
Refrigerators, exterior
Ribs, boat
Ribs, canoe
Ribs, motor boat
Rims, automobile wheels
Rims, carriage wheels
Rivers, stair
Rockers, chair
Rollers
Rollers, caster
Rosettes, wall (stairway)
Round, ladder
Round, plow
Rungs, ladder
Runners, bob sled
Saddles, horse
Saddles, wagon wheels
Sash, electric cars
Sash, railway cars
Seat boards, light delivery
wagon
Seat frames, canoe
Shackle bars, light delivery
wagon
Shaffs, light vehicles
Shelves, dumb waiter
Shoe rails (stair)
Showcases, exterior
Sides, billiard tables
Sides, push cart
Sidewalks, truck
Side pilasters, light delivery
wagon

Sides, wagon bodies
Side futchels, light delivery
wagon
Side slats, light delivery
wagon
Signs, blades, railroad
Silts, automobile
Silts, buggy
Silts, buggy bodies
Silts, carriage
Silts, carriage bodies
Silts, delivery wagons
Silts, light delivery wagons
Silts, inside window (electric
Sills, windows, inside (railway
cars)
Slat (automobile tops)
Slat, bed
Slats, trunk
Slats, wagon top
Sleds
Sleds, frame work
Sleds, toy
Splinter bars, light delivery
wagon
Spokes, automobile wheels
Spokes, heavy vehicle wheels
Spokes, light delivery wagons
Spokes, push cart wheels
Spring yokes, light delivery
wagon
Staffs, flag
Staffs, log cars
Stands, umbrella
Staves, butter pail
Staves, slack cooperation
Staves, buggy cooperation
Staves, washing machine
Stay bars, light delivery wagons
Stay, boat
Stems, canoe
Stems, motor boat
Stems, river craft
Stems, ships
Stems, yachts
Sten, Poets, motor boat
Stiles, door
Steps, door, house interior trim
Steps, drawer
Stretchers, curtain
String boards (stair)
Strings (elevator cars)
Stripes, guide (elevator)
Swaying cleats, curtail pole
Tables, sewing
Tables, telephone
Tallies, coin boxes
Tillers, river craft
Top rails, light delivery wagon
Top boards, wagon wheels
top slats, light delivery wagon
bodies
Top wagons, washing machines
Tread, stair
Tripods, camera
Upholster heads, light delivery
wagon
Veneer
Wainscot rail, house interior
trim
Wainscoting, house interior trim
Wallwainscoting cap, house interior
trim
Window apron, house interior
trim
Window stool, house interior
trim

ASPIN.

Excelsior

BASSWOOD.

Baskets, split
Base blocks, house interior trim
Base blocks, house interior trim
Base boards, house interior trim
Base corners, house interior
Pillars, light delivery
Base moulding, house interior
trim
Beams, dining room ceiling
Bedsteads, hidden work
Bellows, organ
Bellows, organ
Hollows, organ
Binding strips, school board
Blinds, window
Blocks, brake
Blocks, brush
Blocks, tassel
Blowers, organ

Alters, church
Animals, toy
Astragal, folding door
Astragal, sliding door
Backings, mirror
Backs, buffets
Backs, bureaus
Backs, chiffleboards
Backs, mirror

146
Baskets, split
Bay brackets, house construction
Beech, dining room ceiling
Blocks, brake
Blocks, bush
Boards, beam
Boards, bread
Boards, lap
Boards, pastry
Book shelves
Bottom panels, piano cases
Bottoms, carriage bodies
Bottoms, candy
Panel strips, house interior trim
Panels, door
Paper pulp
Paring strip, house interior trim
Parition moulds, house interior trim
Pedal boards, piano cases
Pews, church
Piano, toy
Plinths, piano cases
Pipes, organ
Plate rail, dining room
Rails, curtain display
Rails, rug display
Rails, door
Rails, table
Reeds, electric wire
Reeds, solder wire
Refrigerators
Rims, split wood pulleys
Sash, window
Seats, automobile
Seats, chair
Seats, tricycle
Serving tables, hidden work
Shelving
Sideboards, interior work
Side boards, wheelbarrow
Sides, piano cases
Sides, toy wagons
Sides, wagon bodies
Siding, house
Sink aprons, house interior trim
Slats, automobile tops
Slats, wagon tops
Spouting, muck mill
Stands, bible
Staves, slack cooperage
Staves, tight cooperage
Step ladders
Sticks, umbrella
Stiles, door
Steps, door, house interior trim
Steps, window, house interior trim
Stretchers, curtain
Strips, felt bound school slates
Tables
Tables, ironing
Templates, shipbuilding
Top panels, piano cases
Top rails, sash
Top slats, light delivery wagon bodies
Top, kitchen table
Top, piano cases
Top, table
Toy pianos
Trays, incubator
Trays, trunk
Trunks
Veneer
Wainscot rail, house interior trim
Wainscoting, cap, house interior trim
Wheelbarrows, toy
Window apron, house interior trim
Window stool, house interior trim

BEECH.
Carpet strip, house interior trim.

Cases, blacking
Cases, shipping
Casing, door
Casing, window
Celery crates
Center arms, split wood pulleys
Chair rail, house interior trim
Chairs, children's
Chairs, folding camp
Chairs, ladder
Charcoal bricks, piano case
Chips, brewers
Chopping blocks
Chutes, trouser hanger
Clothes driers
Colonnades, house interior trim
Concaves
Consoles
Corner blocks, house interior trim
Costumers
Cots, camp
Crating
Creating, porch roof
Cross-ties, railroad
Door boards, coal car
Door boards, railway grain car
Doors, folding
Doors, sliding
Dowel
Dust cap, house interior trim
End sils, log cars
Face brackets, house construction
Fall boards, piano cases
Feet, piano
Fellows, wheelbarrow wheel
Fillet, house interior trim
Fixtures, curtain
Flat battens, house interior trim
Flooring, house
Flooring, mine dump cars
Frame work, farm machinery
Frames, buck saw
Frames, corn shelter
Frames, door
Frames, front door side light
Frames, light vehicles
Frames, school slate
Frames, window
Frieze rail, porch
Front doors, house
Furniture, camp
Gabble brackets, house construction
Gable ornaments, house construction
Grilles, house interior trim
Handles, ax
Handles, boming knife
Handles, broom
Handles, butcher knives
Handles, carpenter try-square
Handles, coal stoves
Handles, crosscut saw

Birch, black.

End sils, log car
Fellows, heavy vehicle wheels
Handles, butcher knives

Posts, chair
Posts, dresser
Rails, bed
Rails, door
Rails, kitchen table
Reels, hose
Refrigerators, exterior
Rims, fruit baskets
Round, chair
Roping machines, bookbinders
Rungs, ladder
Screens, door
Screen, window
Scroll saws, balusters, porch
Seats, buggy
Seats, lawn swings
Sides, cheese box
Sides, drawer
Sides, piano case
Sides, step ladder
Sink aprons, house interior trim
Slat, ash can
Slat, lawn swings
Slides, table
Spindles, porch
Springs, mine
Staves, flag
Staves, coopersage
Step ladder chairs
Steps, step ladder
Sticks, flower
Sticks, umbrella
Stiles, door
Stools, camp
Stops, door, house interior trim
Stops, window, house interior trim
Tobacco tins
Tongues, toy wagon
Top panels, piano case
Top rail, porch
Top rails, sash
Top, kitchen table
Top, piano case
Top, sles
Toy express wagons
Toy furniture
Toy tops
Traps, game
Traps, house
Traps, rat
Veneer
Walnut, rail, house interior trim
Window sash cap, house interior
trims
Walkers, baby
Wedges, mine cap
Wheelbarrows
Window apron, house interior trim
Window stool, house interior trim
Wire cloth display racks

BIRCH—Continued.

Handles, fruit baskets
Handles, lawn rake
Handles, long handled dirt pans
Handles, plane
Handles, skimming knives
Handles, steak knife
Handles, sticking knife
Handles, wheelbarrow
Handles, whip
Hangers, clothes
Hangers, garment
Head blocks, house interior trim
Head casings, house interior trim
Head, cooperage
Head, nail leg
Heading, slack cooperage
Hubs, wheelbarrow
Interior finish, freight cars
Interior, slip, piano case
Key blocks, piano case
Key bottoms, piano cases
Key, slip, piano cases
Lath
Legs, table
Legs, ironing board
Mantels
Medicine cabinets
Mine props
Meeting rails, sash
Mirror doors, house
Moulding, bed, house construction
Moulding, cap, house interior trim
Moulding, cove
Moulding, crown, house construction
Moulding, drip cap, house construction
Moulding, picture
Moulding, piano case
Moulding, plaster, house construction
Moulding, quarter round
Moulding, spring cope, house construction
Mullions, sash
Music shelf, piano case
Nosing, house interior trim
Novelties
Panel strips, house interior trim
Panels, door
Paper pulp
Parasol sticks
Partition moulds, house interior trim
Pars, bookbinders machinery
Pedal boards, piano cases
Pillasters, piano cases
Plugs, carriage
Plugs, clothes
Pipe, wooden water
Planes, moulding
Plate rail, dining room
Poles, curtain
Porch columns, built up
Porch newels, built up
Porch spandrels

BIRCH, PAPER.

Handles, engravers tools
Handles, file
Handles, pole
Hubs, toy wagon
Hubs, toy wheelbarrow
Knee
Knob
Knobs, drawer
Moulding, piano
Novelties
Organ parts
Plugs, paper
Poles, rug
Rollers, curtain

BIRCH, PAPER.

Rollers, lawn mower
Sewing, cabinet
Spindles, chair
Spools
Spools, ribbon
Spools, wooden
Sticks, candy
Toothpicks
Toys
Turning
Wheels, toy wagon
Wood wool
BIRCH, SWEET.
Sides, mine dump cars
Sides, piano cases
Sills, cart
Sink mata
Slats, bed
Slides, table
Sommets
Spindles, chair
Spools, electric wire
Springs, mine
Staff, flag
Staves, cement barrels
Staves, cooperage
Staves, stack cooperage
Sticks, flower
Stools, foot
Stools, office
Stools, piano
Stops, door, house interior trim
Stove fronts

Boxes, Stops, Boxes, Dairy Crates,
Chairs, Chairs, Blocks,
Staves,
Handles,
Engravings,
Boxes,
Boards,
Balls,
Store

Somnols
Doors,
Casing,
Carpets

BOXWOOD

Boxes, comb
Engravings, wood
Handles, umbrella

BIRCH, SWEET—Continued.

Boxes, Dairy, Boxes, Staves,
Handles,
Engravings,
Boxes,
Boards,
Balls,
Store

Stretcher, chair
String boards, stair
Swing, lawn
Switchboards, telephone
Tables
Tables, billiard
Table, library
Table, pool
Table, sewing
Tabourettes
Tool chests
Top panels, piano cases
Top slats, light delivery wagon
Top sash, house interior trim
Wainscoting cap, house interior trim
Wainscoting cap, house interior trim
Window apron, house interior trim
Window stool, house interior trim

BIRCH, YELLOW

Dishes, butter
Facing, window partition
Handles, broom
Hammer, dust brush
Handles, wrench
Heads, spool
Horses, clothes
Implement, agricultural
Interior finish, electric cars
Interior finish, railway cars
Interior finish, railway coaches
Mallets, croquet
Middle, spool
Mills, coffee
Mirrors, hand
Moulds, butter
Novelties
Panel wainscoting, railway cars
Panels, ceiling, railway cars
Panels, window, railway cars

BOXWOOD

Boxes, comb
Engravings, wood
Handles, umbrella

Boxes, Dairy, Boxes, Staves,
Handles,
Engravings,
Boxes,
Boards,
Balls,
Store

BRIAR ROOT

Pipes, smoking

BUCKEYE, OHIO

Flat battens, house interior trim
Frames, door
Frames, front door side lights
Frames, window
Frieze, rail, porch
Front doors, house
Gable brackets, house construction
Gable ornaments, house construction
Grilles, house interior trim
Head blocks, house interior trim
Head casing, house interior trim
Jamb, door
Mantels
Mirror doors, house
Moulding, bed, house construction
Moulding, brick, house construction
Moulding, cap, house interior trim
Moulding, cove
Moulding, crown, house construction
Moulding, drip cap, house construction
Moulding, picture
Moulding, plaster, house construction
Moulding, quarter round

Moulding, screw
Moulding, sprung cove, house construction
Nosing, house interior trim
Panel strips, house interior trim
Parting stop, house interior trim
Partition moulds, house interior trim
Plate rail, dining room
Porch columns, solid
Porch newels, built up
Porch newel, solid
Porch spindrels
Racks, clothes
Racks, towel
Scroll sawed balusters, porch
Siding, house
Sink aprons, house interior trim
Slide, fly screen
Splendes, porch
Steps, door, house interior trim
Steps, window, house interior trim

Moulding, screw
Moulding, sprung cove, house construction
Nosing, house interior trim
Panel strips, house interior trim
Parting stop, house interior trim
Partition moulds, house interior trim
Plate rail, dining room
Porch columns, solid
Porch newel, built up
Porch newel, solid
Porch spindrels
Racks, clothes
Racks, towel
Scroll sawed balusters, porch
Siding, house
Sink aprons, house interior trim
Sliding, fly screen
Splendes, porch
Steps, door, house interior trim
Steps, window, house interior trim

Moulding, screw
Moulding, sprung cove, house construction
Nosing, house interior trim
Panel strips, house interior trim
Parting stop, house interior trim
Partition moulds, house interior trim
Plate rail, dining room
Porch columns, solid
Porch newel, built up
Porch newel, solid
Porch spindrels
Racks, clothes
Racks, towel
Scroll sawed balusters, porch
Siding, house
Sink aprons, house interior trim
Sliding, fly screen
Splendes, porch
Steps, door, house interior trim
Steps, window, house interior trim

Moulding, screw
Moulding, sprung cove, house construction
Nosing, house interior trim
Panel strips, house interior trim
Parting stop, house interior trim
Partition moulds, house interior trim
Plate rail, dining room
Porch columns, solid
Porch newel, built up
Porch newel, solid
Porch spindrels
Racks, clothes
Racks, towel
Scroll sawed balusters, porch
Siding, house
Sink aprons, house interior trim
Sliding, fly screen
Splendes, porch
Steps, door, house interior trim
Steps, window, house interior trim

Moulding, screw
Moulding, sprung cove, house construction
Nosing, house interior trim
Panel strips, house interior trim
Parting stop, house interior trim
Partition moulds, house interior trim
Plate rail, dining room
Porch columns, solid
Porch newel, built up
Porch newel, solid
Porch spindrels
Racks, clothes
Racks, towel
Scroll sawed balusters, porch
Siding, house
Sink aprons, house interior trim
Sliding, fly screen
Splendes, porch
Steps, door, house interior trim
Steps, window, house interior trim
Chestnut-Continued

Astragals, folding door Astragals, sliding door Backs, brush Backing, bureau Backing, desk Backing, dresser Backing, furniture Backing, sideboards Backing, washstand Backs, piano Balusters (eider) Base blocks, house interior trim Baseboards Baseboard, house interior trim Base corners, house interior trim Base moulding, house interior trim Beams, dining room ceiling Beds, folding Bedsteads, exterior Bedsteads, hidden work Blinds, window Bodied, toy wheelbarrows Bookcases, sectional Book racks, revolving Bookshelves, queen exterior Bottoms, grape basket Box ends, fertilizer sowers Box shocks Boxes, clodhoppers' Boxes, coal sliver Boxes, packing Boxes, plant Boxes, tin plate Boxes Boxing Brackets, plate rail Brackets, stair Buffets, exterior Bureaus, hidden work Bureaus, exterior Busiel crates Cabinetts, magazine Cabinets, scale Cabinets, smokers, Corner strips, house interior trim Cars, passenger elevator Cases (casket) Cases, medicine Cases, piano Case, veneer Casing Casing, door Casing, window Caskets Ceilings Cellar doors Chair rail, house interior trim Chairs Panels, window (Pullman coaches) Paper pulp Partitions, office Partitions, store Parts, automobile bodies Patterns Patterns, foundry Peel blades, bakers' Pipes, organ Plate holders (camera) Plate rail, dinner room Platforms, counter scales Poison cases (drug store) Press boards, bookbinders' Push button frames (Pullman coaches) Rails, door Rails, table Range finders, camera Refractors, soda fountain Risers, stairway Raising machines, bookbinders' Sash, automobile Sash, electric cars Sash, Pullman coaches Seats, water closet Seats, wire frame chairs Showcases Sides, drawer Sills, inside window (electric cars) Sides, drawer Sashes, drawers Sashes, rides, craftsman Stands, city directory Stiles, door Stops, door, house interior trim Stools, counter Tops, table Tops, wire frame tables Track sections, camera Treads, stairs Triangles (billiard) Triangles, draftsmen Vener Veneers Veneers, rail, house interior trim Veneers, visible, house interior trim Window apron, house interior trim Window stool, house interior trim

Chestnut

Paper pulp

Chefs, arm Chairs, desk Chairs, mission Chairs, rocking Chests, bail Chifforboards China cases, shelving Collins Colonades, house interior trim Columns, china closet Couch, eider, sideboard Commodes Consoles Cores, door Cores, veneering Corner blocks, house interior trim Couch frames Counters, store Crates Crating Cross arms, telegraph pole Cross ties, railroad Desks Doors Doors, folding Doors, sliding Drain boards, sink Drawer fronts Drawer sides Dressers
CHESTNUT—Continued

Handles, butcher steel
Handles, carpenters' brace
Handles, combination tool sets

COCCOBOL

Handles, hand wood drill
Handles, palette knife
Handles, paring knives

CONGO

Handles, umbrella

COTTONWOOD

Brooders, poultry
Cabinets, inside work
Cabinets, kitchen
Capping, sink, house interior trim
Carpet strip, house interior trim
Cases, beer
Cases, egg
Casing, door
Casing, window
Caskets
Chair rail, house interior trim
Chair boxes
Cloth boxes
Confins
Colonades, house interior trim
Commodities, interior
Consolides
Cooperation, slack
Cooks, pantries
Corner blocks, house interior trim
Crate, berry
Crates, milk bottle
Crating
Creaming, porch roof
Cupboards, kitchen
Doors, folding
Doors, sliding
Dowels, chair
Drawers, incubator
Excellor

Shelves, book
Shelves, piano
Singles
Showcase
Sideboards
Sideboards, built in
Sides, billiard tables
Siding, house
Sides, piano cases
Siding, plate glass shipping cases
Slat, trunk
Sofas, exterior
Stands, plant
Stoves, cabinet barcelas
Staves, slack cooperation
Staves, tight cooperation
Steps, door, house interior trim
String boards (stair)
Swell boxes, pipe organ
Tables, dropleaf
Tables, extension
Tables, library
Tables, tea
Tool chests, toy
Top frames, piano
Top, piano
Top, table
Toy furniture
Toy tops
Treads, stair
Veneer
Veneer cores, piano cases
Wainscots, house interior trim
Wainscoting, Wainscoting cap, house interior trim
Washstands
Washstands, exterior
Window apron, house interior trim
Window stool, house interior trim

Face brackets, house construction
Fillet, house interior trim
Fixtures, barroom
Fixtures, office
Fixtures, store
Flat battens, house interior trim
Footstools
Frames, box couches
Frames, door
Frames, front door sidelight
Frames, upholstered furniture
Frames, wood
Frieze rail, porch
Front doors, house
Gable brackets, house construction
Gable ornaments, house construction
Grilles, house interior trim
Head blocks, house interior trim
Head casing, house interior trim
Hoppers, curd grinding machines
Incubators
Interior work, electric shoe shining machines
Jambs, door
Lath
Lining, freight cars
Lining, wagon bodies
Mantels
Meeting rails, sash
Mirror doors, house
Moulding, bed, house construction
Moulding, brick, house construction
Moulding, cap, house interior trim
Moulding, cove
Moulding, crown, house construction
Moulding, drip cap, house construction
Moulding, picture
Moulding, plaster, house construction
Moulding, quarter round
Moulding, screen
Moulding, spring cove, house construction
Mullions, sash
Nosing, house interior trim
Packages, fruit
Packaging cases, plate glass
Panel, agricultural machinery

Panels, door
Panels, light vehicle bodies
Panels, light vehicle seats
Panels, spring wagon bodies
Panel strips, house interior trim
Panels, threshing machine
Parting stop, house interior trim
Partition molds, house interior trim
Parts, door
Parts, flour mill machinery
Plate rail, dining room
Porch columns, built up
Porch columns, solid
Porch newels, built up
Porch newels, solid
Porch spandrels
Roof slats, wagon bodies
Scroll saw, balusters, porch
Shredders, fodder
Shipping cases, butter
Sides, farm wagon bodies
Sink aprons, house interior trim

COTTONWOOD—Continued

Base blocks, house interior trim
Baseboard, house interior trim
Base corners, house interior trim
Baseboard, house interior trim
Base moulding, house interior trim
Beds, spring wagon
Blind stop, house construction
Brackets, plate rail
Carpet strip, house interior trim
Casing, door
Casing, house
Casing, window
Chair rail, house interior trim
Columns, house interior trim
Corner blocks, house interior trim
Doors, folding
Doors, sliding

Astragals, folding door
Astragals, sliding door
Balusters, porch
Bars, greenhouse
Base blocks, house interior trim
Baseboard, house interior trim
Baseboard, house interior trim
Baseboard, house interior trim
Baseboard, house interior trim
Battens, O. G. barn
Bay brackets, house construction
Beams, dining room ceiling
Beams, pergola
Beehives
Bell poles, machinists'
Bevel siding, house
Blind stop, house construction
Blinds (house)
Bottom boards, rowboat
Bottom rail, porch
Bottom rails (sash)
Boxes, bottle
Boxwood
Brackets, plate rail
Brackets, porch
Broodiers, interior
Cabins, exterior, river craft
Cabins, exterior, ships
Cabins, exterior, yachts
Cabins, interior, river craft
Cabins, interior, ships
Cabinets, interior, yachts
Cabinet strip, house interior trim
Cases, casket
Cases, coffin
Cases, incubator

Dust cap, house interior trim
Fillet, house interior trim
Frames, door
Frames, window
Grilles, house interior trim
Head blocks, house interior trim
Jambe, door
Mantels
Mantels, painted work
Mirror doors, house
Moulding, bed, house construction
Moulding, cap, house interior trim
Moulding, cove
Moulding, crown, house construction
Moulding, drip cap, house construction

CUCUMBER

Cases, packing
Casing
Casing, door
Casing, window
Caskets
Chair rail, house interior trim
Churns, butter
Coffins
Columns, house interior trim
Columns, pergola
Corner blocks
Corner beads, house interior trim
Corner blocks, house interior trim
Cortice, house construction
Cortice work, house
Crates, shipping
Cresting, porch roof
Cross arms, telegraph pole
Cross ties, railroad
Decking, motor boat
Doors, doors, folding
Door, railroad passenger
Doors, sliding
Dust cap, house interior trim
Exterior finish, house
Face brackets, house construction
Fillet, house interior trim
Finish, locomotive cars
Finish, yacht cabin
Flats, house interior trim
Floor boards, rowboat, round bottom
Flooring, porch
Frames, door

Moulding, picture
Moulding, quarter round
Moulding, spring cove, house construction
Nosing, house interior trim
Paper, pulp
Partition moulds, house interior trim
Plate rail, dining room
Plates, split wood pulleys
Siding, house
Slip, fly screen
Wainscoting cap, house interior trim
Wainscot, house interior trim
Window stool, house interior trim

CYPRESS

Frames, front door sidelights
Frames, window
Frames, porch
Front door, house
Gable brackets, house construction
Gable ornaments, house construction
Gates, railroad crossing
Grilles, house interior trim
Hatch covers, river craft
Hatch covers, ship
Hatch covers, yacht
Head blocks, house interior trim
Head casing, house interior trim
Interior, cupboard
Interior finish, house
Jambe, door
Keels, canal boats
Keels, river craft
Keels, ship
Keels, yacht
Keels on rowboat (flat bottom)
Leathers
Lattice
Leafboards, canoes
Lids, washing machine
Mantels
Meeting rails (sash)
Moulding, bed, house interior trim
Moulding, cove
Moulding, brick, house construction
Moulding, cap, house interior trim

154
CYPRESS—Continued.

<table>
<thead>
<tr>
<th>Material</th>
<th>Products/Uses</th>
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<tbody>
<tr>
<td>Molding, crown</td>
<td>House construction</td>
</tr>
<tr>
<td>Molding, drip cap</td>
<td>House construction</td>
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<td>Molding, exterior</td>
<td>House construction</td>
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<tr>
<td>Molding, picture</td>
<td>Porch columns, built up</td>
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<tr>
<td>Molding, plaster</td>
<td>Porch columns, solid</td>
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<td>Molding, spring</td>
<td>Porch newels, built up</td>
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<tr>
<td>Molding, screen</td>
<td>Porch newels, solid</td>
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<td>Molding, spring</td>
<td>Porch, spandrel</td>
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<td>Molding, spring</td>
<td>Rafters, pergola</td>
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<td>Rails, door</td>
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<td>Molding, quarter</td>
<td>Rudders, ship</td>
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<td>Rudders, yacht</td>
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<td>Sash</td>
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<td>Sash, holed</td>
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<td>Molding, spring</td>
<td>Sash, railroad passenger coach</td>
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<td>Molding, spring</td>
<td>Screens, door</td>
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<td>Molding, spring</td>
<td>Screens, window</td>
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<tr>
<td>Molding, spring</td>
<td>Shingles</td>
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<td>Sides, rowboat (flat bottom)</td>
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<td>Silos</td>
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<td>Molding, spring</td>
<td>Slide, fly screen</td>
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<td>Molding, spring</td>
<td>Spindles, porch</td>
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<td>Molding, spring</td>
<td>Staves, tight cooperation</td>
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<td>Molding, spring</td>
<td>Stiles, door</td>
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<tr>
<th>Material</th>
<th>Products/Uses</th>
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<tr>
<td>DOGWOOD</td>
<td>Handles, kitchen fork</td>
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<tr>
<td>DOGWOOD</td>
<td>Handles, small tools</td>
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<tr>
<td>DOGWOOD</td>
<td>Mallets, coppersmith</td>
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<table>
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<th>Material</th>
<th>Products/Uses</th>
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<tr>
<td>EBONY</td>
<td>Chessmen</td>
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<tr>
<td>EBONY</td>
<td>Handles, chafing dish</td>
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<td>Handles, drawing instruments</td>
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<td>EBONY</td>
<td>Handles, pocket knife</td>
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<td>EBONY</td>
<td>Handles, tea strainer</td>
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<td>Handles, umbrella</td>
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<td>EBONY</td>
<td>Pipes, smoking</td>
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<td>EBONY</td>
<td>Walking sticks</td>
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<th>Material</th>
<th>Products/Uses</th>
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<tr>
<td>ELM, CORK</td>
<td>Gear parts, flour mill machinery</td>
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<td>ELM, CORK</td>
<td>Guide rails, dumb-waiters</td>
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<td>ELM, CORK</td>
<td>Handles, plow</td>
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<td>ELM, CORK</td>
<td>Hay rake parts</td>
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<td>Heading, slack cooperation</td>
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<td>ELM, CORK</td>
<td>Hoops, slack cooperation</td>
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<td>Hoppers, grain</td>
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<td>Hubs</td>
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<td>ELM, CORK</td>
<td>Hubs, light delivery wagons</td>
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<td>Ladders</td>
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<td>Over-hand beams, dumb-waiters</td>
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<td>ELM, CORK</td>
<td>Parts, automobile bodies</td>
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<td>Platforms, elevator</td>
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<td>Bushel measures</td>
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<td>Cabinets, medicine</td>
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<td>China closets, inside work</td>
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<td>Commodities, inside work</td>
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<td>Crating</td>
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<td>Handles, basket</td>
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<td>Handles, canbook</td>
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<td>ELM, WHITE</td>
<td>Handles, cross-cut saw</td>
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<td>Handles, peavy</td>
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<td>ELM, WHITE</td>
<td>Heading, slack cooperation</td>
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<td>ELM, WHITE</td>
<td>Hoops, slack cooperation</td>
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<td>ELM, WHITE</td>
<td>Hubs, wheelbarrow</td>
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<td>Ladders, step</td>
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<td>ELM, WHITE</td>
<td>Parts, washing machine</td>
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</tbody>
</table>
Astragal, folding door
Astragal, sliding door
Balusters, porch
Base blocks, house interior trim
Base board, house interior trim
Base corners, house interior trim
Base moulding, house interior trim
Bay brackets, house construction
Beans, dining room ceiling
Bevel siding, house
Blind stop, house construction
Blinds, window
Booms, river craft
Booms, ship
Bottom boards, barge
Bottom boards, row boat
Bottom boards, saw
Bottom rail, porch
Bottoms, piano cases
Brackets, plate rail
Brackets, porch
Brackets, telegraph pole
Bumping posts, railroad
Cabins, exterior, river craft
Cabin, exterior, ships
Cabin, exterior, yacht
Capping, sink, house interior trim
Carpet strip, house interior trim
Casing, door
Casing, window
Ceiling
Chair rail, house interior trim
Colonnades, house interior trim
Corner blocks, house interior trim
Corner, house construction
Covers, vats
Cresting, porch roof
Cross-arms, telegraph pole
Cross-ties, railroad
Decking, boats
Decking (ship and boat)
Derricks, hoisting
Derricks, oil well
Doors, folding
Doors, sliding
Drop siding, house
Dust cap, house interior trim
Face brackets, house construction
Feed mill machinery parts
Fillet, house interior trim
Fireless cookers, exterior

Pantries, church
Pins, insulator
Poires, horse
Refrigerator, tin
Rims, cheese box
Rims, stove
Rungs, ladder
Seat frames, chair

EUCALYPTUS
Furniture, special work

FIR, BALSAM
Oars, boat
Pulp, paper
Silos

FIR, DOUGLAS
Flat battens, house interior trim
Flooring, electric passenger cars
Flooring, freight cars
Flooring, house
Flooring, porch
Flooring, railway passenger coaches
Flooring, scale platforms
Frames, door
Frames, freight car
Frames, front door side light
Frames, target
Frames, window
Frieze rail, porch
Front doors, house
Gable brackets, house construction
Gable ornaments, house construction
Gates, railway crossing
Hay balers, parts
Hayloaders, parts
Hayrakes, parts
Head blocks, house interior trim
Head casing, house interior trim
Hoods, mortars
Jamb, door
Joiners, deck (ship)
Keels, canal boats
Keelsons, river craft
Keelsons, ship
Keelsons, yacht
Ladders, extension
Ladders, step
Lath
Lattice
Masts, river craft
Masts (ship)
Mirror doors, house
Modelling, bed, house construction
Modelling, brick, house construction
Modelling, cap, house interior trim
Modelling, cove
Modelling, crown, house construction
Modelling, drip cap, interior trim
Modelling, plaster, house construction
Modelling, quarter round
Modelling, spring cove, house construction
Modelling, house interior trim

FIR, OREGON
Push poles, locomotive

GUM, BLACK
Cross-ties, railroad
Fenders, river craft
Friction blocks (railway cars)
Heading, oil bands

ELM, WHITE
Showcases
Slaves, ash
Signboards
Slats, trunk
Sleds, bob
Slides, extensional
Split baskets, porch hammers
Stands, bible
Staves, slack cooperage

Stops, drawer
Tables, communion
Telephones, apparatus
Tops, sleds
Traps, mouse
Traps, rat
Tubs
Washboards, laundry
Venet

Freezers, ice cream
Lath

Blind stop, house construction

Hubs
Hubs, carriage wheels
Hubs, light delivery wagon
Hubs, wheelbarrow
Baskets, split
Baskets, vegetable
Bottoins, drawer
Boxes, berry
Boxes, cigar
Boxes, cracker
Boxes, milk bottle
Boxes, packing
Boxes, trunk
Cases, sample
Cases, traveling

Cabinets, Boxes, Blinds, Balusters, Drawers, Doors, Cross-ties, Crating
Coolers, Commodes, Coffins, Caskets, Casing, Cases, Cases, Cases, Cases, Cases, Carpel
Capping, Brackets, Boxes, Box Bottoms, Blocks, Bay Base Backs, Backs, Drawers, Chairs, Chair Beams, Base Backing, Fenders, Cross-ties, Fenders, Fenders, Fenders, Fenders, Fenders, Fenders, Fenders, Fenders, Fenders
Barge Mauls, Balusters, Blocks, Blocks, Blocks, Blocks, Blocks, Blocks, Blocks, Blocks, Blocks
Moulding, Moulding, Moulding, Moulding, Moulding, Moulding, Moulding, Moulding, Moulding, Moulding, Moulding, Moulding, Moulding, Moulding, Moulding, Moulding, Moulding, Moulding

Astragals, sliding door
Backs, chairs
Backing, case goods
Balkusters, porch
Base blocks, house interior trim
Base board, house interior trim
Base corners, house interior
Base moulding, house interior trim
Bay brackets, house construction
Beams, dining room ceiling
Blinds, house construction
Boxes, bins, Bottoins, case goods
Bottom rails, porch
Bottom rails, sash
Box shooks
Boxes, creamery shipping
Boxes, machinery
Boxes, packing
Boxes, trunk
Brackets, porch
Cabinets, music
Capping, sink, house, interior trim
Carpet strip, house interior trim
Cases, casket
Cases, clock
Cases, coffin
Cases, sample
Cases, shipping
Casing, door
Casing, door
Casing, door
Caskets
Chair rail, house interior trim
Chairs, rocking
Coal boards, engine tender
Collars
Colonnades, house interior trim
Consoles
Commodities
Coolers, water
Corner blocks, house interior trim

Crafting
Cresting, porch roof
Cross-ties, railroad
Doors
Doors, holding
Doors, sliding
Drawer sides
Drawers
Drawers, cabinets
Dust cap, house interior trim

Gum, BLACK—Concluded
Packing cases, plate glass
Rollers, car

GUM, COTTON
Coops, poultry
Crates, beer
Crates, fruit
Crates, vegetable
Crating
Cross-ties, railroad
Dishes, bard
Heads, mail
Hoppers, machine
Legs, table
Mailots, ship builders

GUM, BLACK
Friction blocks (railway cars)
Healing, oil barrels
Hubs
Hubs, carriage wheels
Hubs, light delivery wagon
Hubs, wheelbarrow

GUM, RED
Face brackets, house construction
Feather distributors, parts
Fillet, house interior trim
Flasks, foundry
Flat battens, house interior trim
Frames, chair
Frames, demountable
Frames, door
Frames, dresser
Frames, front door side light
Frames, window
Frieze rail, porch
Front doors, house
Front rails, beds
Front rails, dresser
Furniture
Gable brackets, house construction
Gable ornaments, house construction
Handles, saw
Handle, Adrian
Head blocks, pattern
Head blocks, house interior trim
Head cases, house interior trim
Hidden work, walnut furniture
House interior trim
Interior finish, house
Jamb, door
Jumprers, baby
Lath
Legs, chifforier
Legs, dresser
Mantels
Meeting rails, sash
Mirror doors, house
Moulding, bed, house construction
Moulding, brick, house construction
Moulding, cap, house interior trim
Moulding, cove
Moulding, crown, house construction
Moulding, drip cap, house construction
Moulding, picture
Moulding, plaster, house construction
Moulding, quarter round
Moulding, spring core, house construction
Mullions, sash
Nosing, house interior trim

HELMLOCK
Base blocks, house interior trim
Base board, house interior trim
Base corners, house interior trim

Rollers, mine
Staves, oil barrels

Mortars
Paper pulp
Parts, agricultural machinery
Pestles
Fins, clothes
Plates, pie
Rammers, street
Rollers, awning
Rollers, shipbuilders
Truck barrels, veneered
Mauls
Mile rollers
Packing cases, plate glass
Rollers, car
Rollers, mine
Staves, oil barrels

Panel strips, house interior trim
Panels, door
Panels, light delivery wagon bodies
Panels, light vehicle bodies
Panels, stair work
Paper pulp
Parting stop, house interior trim
Partition moulds, house construction
Pipes (smoking)
Plate rail, dining room
Plate rail, house interior trim
Porch columns, built up
Porch columns, solid
Porch newels, built up
Porch newels, solid
Porch spandrels
Posts, beds
Posts, dresser
Pulleys
Rails, door
Rails, dresser
Refrigerators, exterior
Scroll-sawn balusters, porch
Side frames, chair
Shelving, cabinets
Sink aprons, house interior trim
Slide, fly screen
Spindles, porch
Stands, chifforier
Standards, dresser
Staves, cement barrels
Sticks, parasol
Stiles, door
Strips, weather
Stops, door, house interior trim
Stops, window, house interior trim

Tables, library
Top rail, porch
Top rails, sash
Tops, desk
Tops, dressers
Tops, chifforier
Tops, sideboards
Traps, house
Wainscoting cap, house interior trim
Wainscot rail, house interior trim
Walkers, baby
Window apron, house interior trim
Window stool, house interior trim

Astragals, folding door
Astragals, sliding door
Balkusters, porch
Balkusters (stair)
Barge construction

Base moulding, house interior trim
Battles, O. G. barn
Bay brackets, house construction
HEMLOCK—Concluded.

Frieze, mill, porch
Frieze, doors, house
Fruit jar cases
Gable brackets, house construction
Gable ornaments, house construction
Grilles, house interior trim
Hatch covers, river craft
Hatch covers, ship
Head blocks, house interior trim
Head casing, house interior trim
Heading, nail keg
Heading, slack cooperage stock
Jaculators
Keels, river craft
Keels, ship
Kelsons, canal boat
Ladders, river craft
Ladders, ship
Lath
Lattice
Limber, canal boats
Masts, river craft
Masts, ship
Mirror doors, house
Moulding, bed, house construction
Moulding, brick, house construction
Moulding, cap, house interior trim
Moulding, cove
Moulding, crown, house construction
Moulding, drip cap, house construction
Moulding, picture
Moulding, plaster, house construction
Moulding, quarter round
Moulding, screen
Moulding, spring cove, house construction
Newel posts, angle
Newel posts, starting
Newel, house interior trim
Pack, boat launching
Packings, plate glass
Pallets, fire brick
Pend strips, house interior trim
Paper pulp
Parting strip, house interior trim

HICKORY

Fellows, light delivery wagons
Fifth wheel bars, light delivery wagon
Fifth wheel circles, light delivery wagon
Fifth wheel spools, light delivery wagon
Fillers, house
Flooring, motor truck
Forks, shanking
Frames, box siled
Frames, coal screen
Frames, gravel screen
Frames, porch chair, rustic
Frames, sand shading screen
Gear parts, automobile
Gear parts, buggey
Gear parts, light vehicle
Gear parts, vehicle
Gear parts, wagon
Gear woods, floor mill machinery
Grain cradles
Hacks, vehicle
Hatches
Handles, adze
Handles, axe
Hooting, blacksmith's hatchet
Handles, smithbinder's machinery
Partition mounds, house interior
Patch-boards, freight car
Planking, canal boat
Planking, river craft
Planking, ship
Planking, yacht
Plate rail, dining room
Poles, flag
Porch columns, built up
Porch columns, solid
Porch newels, built up
Porch newels, solid
Porch spandrul
Rails (stair)
Reels, cable
Reeds, wire rope
Refrigerators
Keats, string
Rosettes, wall (stairway)
Rough horses (stairway)
Scalawag, balusters, porch
Seats, row boat
Shafts (stairs)
Sills (stair)
Side, row boat
Siding, freight car
Siding, solid
Siding, plate glass (staircases)
Sink aprons, house interior trim
Skidding (machine)
Skidding (steam-pump)
Slides, dy screen
Sparks, ship
Spindles, porch
Stair horses
Stair work, hidden
Staves, silo
Staves, slack cooperage
Stems, canal boat
Steps, door, house interior trim
Steps, window, house interior trim
String boards (stair)
Thresholds, house interior trim
Top rail, porch
Tramps, row boat
Tread (stair)
Veener
Walnut, rail, house interior trim
Walnut cap, house interior trim
Weather boarding, house
Window apron, house interior trim
Window stool, house interior trim

Arms, chair
Axle beds, perch spring wagon
Axle beds, surrey
Axle beds, buggsy
Axles, light vehicles
Axles, lumber wagons
Axles, wagon
Backs, rustic porch chairs
Backs, split chairs
Baffles, wagon boxes
Bolts, creamery shipping
Bow, automobile top
Brake beams, freight car
Brake lining, hoisting engines
Canes, walking
Caps, axle
Caps, light vehicle
Carts, dump
Carts, road
Cove, floor mill machinery
Cross bars, buggy shafts
Cross bars, light vehicle
Door boards, coal cars
Door boards, railroad grain cars
Doubtrees
Dowel
Eveners, buggy
Eveners, carriage
Eveners, wagon
Fellows
Fellows, heavy vehicle wheels

158
HICKORY—Concluded

Reaches, buggy
Reels, foot, (electric cars)
Rests, foot, (railway cars)
Ribs, wagon top
Rims
Rims, automobile wheel
Rims, vehicle rims
Rims, wheel
Rollers
Hounds, chair
Hounds, split bottom chair
Hounds, ladder
Hungs, ladder
Runners, sleigh
Runner frames, sleigh
Runners, bob sled
Screws, bookbinder
Seats, rustic porch chair
Seats, split chair
Shackle bars, light delivery wagon
Shafis, buggy
Shafis, vehicle
Shooting sticks, printers'
Side futchels, light delivery wagon
Singletrees
Singletrees, light and heavy vehicles
Skewers, butchers'
Slackers
Splits, split bottom chair
Split baskets, porch hammock

HOLLY

Forks, wooden, salad
Handles, rolling pin
Mashears, potato
Paddles, butter

HORNBEAN

Neck yokes
Handles, peavy
Heads, timber carrier
Heading, nail keg
Heads, grab maul

LAUREL, MOUNTAIN

Inlaid work, furniture

LANEWOOD

Rods, fishing

LIGNUM-VITAE

Cups, lemon squeezer
Cups, lime squeezer
Heads, mallet

LOCUST

Hubs, light delivery wagon
Paper pulp

MAHOGANY

Cabinets, smokers
Cabinets, interior ships
Cabinets, interior, yachts
Carpet strip, house interior trim
Carvings, wood
Cases, binnacle
Cases, chart (ship)
Cases, dental
Cases, hall clock
Cases, optical
Cases, plug
Casing, door
Casing (veneered), pipe organ
Casket, window
Caskets
Cellarettes, exterior
Chair arms, sleeping couches
Chair rail, house interior trim
Chairs, arm
Chairs, morris

SPLINTER bars, light delivery wagon
Spokes, automobile wheel
Spokes, buggy wheel
Spokes, heavy vehicle wheel
Spokes light delivery wagon
Spokes, light and heavy vehicle
Spokes, push cart wheel
Sprags, Mine
Spring bars
Springs, light and heavy vehicle

SPLINTER blocks, wagon
Spring yokes, light delivery wagon
Stakes, heavy vehicle
Stakes, log car
Sweep sticks, loom

Teeth, lawn rake

Tongues, corn planter
Tongues, light vehicle
Tongues, wagon

Treadle sticks, loom

Trucks, warehouse

Upper head blocks, light delivery wagon
Vehicle stock
Wheelbarrows,
Wheels, vehicle
Wrecks, railway
Whiffletrees, vehicle

BRACKETS, telegraph pole
Cross-arms, telegraphs pole

Antique furniture, exterior
Arms, chair
Balusters, stair
Back posts, chair
Base boards, house interior trim
Base moulding, house interior trim
Beams, dining room ceiling
Beds, fold ing, exterior
Bedsteads, exterior
Benches, piano
Book racks, revolving
Book cases, sectional
Brackets, plate rail
Brackets, stair
Cabinets, magazine
Cabinets, music
Cabinets, phonograph
Cabinets, scale

Chests, hall
Chests of drawers, exterior
Chests, silverware
Cheval mirrors
Chiffoniers, exterior
Collins
Colonades, house interior trim
Colonades, fullman coaches
Commodes, exterior
Consoles
Counters, bar room, exterior
Cover, switch box, (electric cars)

Covers, switch box (Pullman coaches)

Cupboard doors, Pullman coaches
Deck boards, automobile
Dash boards, automobile

Decking, canoe
MAHOGANY—Concluded

Decking, motor boat
Desk chairs
Door strips, automobile
Doors, folding
Doors, lockers, boat and ship
Doors, ship cabin
Doors, sliding
Doors, upper berth (sleeping coaches)

Finish, window partitions (electric cars)
Filling cases, sectional
Fillets, house interior trim
Fine cabinet work
Finish, yacht cabins
Floor battens, house interior trim
Flooring, parquetry
Foot rails, stair
Foot rests
Foot stools
Frames, chair
Frames, couch
Frames, davenport
Frames, door, house interior trim
Frames, mirror
Frames, picture
Frames, settee
Frame, upholstered chair

Furniture
Furniture, office
Furniture, special period
Gauges, carpenters'
Glass front boards, automobile
Gunwales, canoe
Grilles, house interior trim
Grilles, Pullman coach
Grilles, ship cabin

Ground glass frames, camera
Halt mirror hairpins
Handled, camera slides
Handles, hand scraper

Head rails, yacht
Head casing, house interior trim

Hubs, pilot wheels, boat and ship

Interior finish, camera

Interior finish, Pullman coaches

Key bottoms, piano

Legs, piano
Legs, table
Lens boards, camera
Lids, water closet
Lunch tables, portable, Pullman coaches

 Mantels
Mirror doors, house
Mirror frames, passenger electric cars
Mirror frames, Pullman coaches
Mirror frames, ship cabins

Models
Models, machine

Moulding, bed, house construction

Moulding, cap, house interior trim
Moulding, cove, house interior trim

Mouldings, crown, house construction

Mouldings, piano

Moulding, spring cove, house interior trim

Music shelf, piano
Newel posts, angle
Newel posts, starting

Panel strips, house interior trim
Panel wainscoting, ship cabin
Panel wainscoting, inside Pullman coaches

Panels, case

Panels, ceiling, Pullman coaches
Panels, clock case
Panels, desk
Panels, passenger elevator cars

Panels, piano cases

Panes, window, Pullman coaches

Parts, automobile bodies

Parfums

Pianists, piano
Pillars, chair
Pilot wheels, ship

Pilot wheels, yacht

Plate holders, camera

Plate rail, dining room

Players, piano

Princess dressers

Push button frames, Pullman coaches

Railroad, chair
Range finders, camera
Rims, pilot wheel (boat and ship)

Rockers, chair

Ruling machines, bookbinders

Sash, Pullman coaches

Sash, ship cabins

Screen, bank

Screens, birch

Seats, piano

Seats, water closet

Settees, dining room table

Settees

Shell covers, book

Shelves, book

Showcases

Sides, piano case

Sills, inside window (electric cars)

Sills, window, inside (Pullman coaches)

Spindles, chair

Stalls, dining dish

Stands, plant

Steering wheel rims, automobile

Stools, piano

Tables, drop leaf

Table, tea

Tables, table

Tables, top, counter

Table, top

Trays, jewelry display

Trays, sewing

Treads, stair

Veneer

Veneer, furniture

Veneer, piano cases

Wainscot, rail, house interior trim

Wainscoting, house interior trim

Wainscoting, cap, house interior trim

Watertight, doors

Waterproof, auto-valet

Wheel trays, dining room

Window apron, house interior trim

Window stool, house interior trim

MAPLE, SOFT

Acetate of lime

Alcohol, wood

Backing, cases

Baskets

Baskets, split

Bed, folding

Blinds, porch

Blinds, Venetian

Blocks, brush

Boards, boshery

Bobbins

Bottom rails, sash

Bottoms, butter pails

Bottoms, carriage bodies

Bottoms, fruit baskets

Boxes

Boxes, bottle

Boxes, comb

Boxes, creamery shipping

Boxes, knife

Boxes, plate glass packing

Boxes, salt

Boxes, tin plate

Boxes, veneer

Brooders

Brooches

Brushes, wall

Brushes, window

Brushes, emulsioned

Cabinet work

Cabinets, medicine

Cases, blackening

Cases, egg

Cases, liquor

Ceramic crates

Center arms, split wood pulleys

Chairs, children's

Chairs, kitchen

Chairs, laundry

Chalkboards

Charcoal

Checkers

Cheese

Cheeseman, emulsions

Clothes racks, laundry

Chiffoniers, emulsions

Cloths

Covers, veneer

Commodities

Commodities, enameled

Costumes

Cranes

Cranes, fruit and vegetable

Cranes, milk bottle

Crafting

Dowels, chair

Driers, towel

Dumb-waiter posts

Dusters

Flooring

Frames, chair

Frames, collapsible crates

Frames, couch

Frames, davenport

Frames, door

Frames, parlor furniture

Frames, sofit

Frames, upholstered chair

Frames, upholstered furniture

Frames, window

Furniture, case goods

Furniture, doll

Furniture, interior work

Guide rails, dumb waiter

Handles, paint brush

Handles, umbrella

Handles, whitenew brushes

Holding, slack cooperage

Hoods, spool

Interior trim

Interior work, sideboard

Lapboards

Lath

Lining, case

Meeting rails, sash

Middle, spool

Monogrid, picture

Muñilens, sash

Novelties

Quills

Plates, door

Paper pulp

Patterns

Pedal boards, organ

Porch blinds

Ralls, door

Reels, cordage mill

Reels, wire

Ruling machines, bookbinders

Sash

Saw horses

Screens, door

Screens, window

Seats, baby carriage

Seats, chair

Shelves, book

Shelving

Shutters

Signs, advertising

Speakers

Spindles, heads

Spools

Stoves

Stoves, black

Stoves, black

Stoves, parlor

Sticks, umbrella
### MAPLE, SOFT—Concluded.

<table>
<thead>
<tr>
<th>Tables</th>
<th>Toy tops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables, kitchen</td>
<td>Veneer</td>
</tr>
<tr>
<td>Top rails, sash</td>
<td>Wash benches</td>
</tr>
<tr>
<td>Toy furniture</td>
<td>Wash stands, enameled</td>
</tr>
</tbody>
</table>

### MAPLE, SUGAR

| Clothes pins | Hangers, coat |
| Cogs, flour mill machinery | Heading, cement barrels |
| Collars, dress separator | Heading, cooperation |
| Corner, typewriter platens | Heading, nail keg |
| Costumes | Heading, slack cooperation |
| Country, billiard | Heads, spoon |
| Covers, butter tub | Hearse tables, (burial carriage) |
| Crucets | Interior finish |
| Cups, billiard | Jaws, lemon squeezer |
| Cups, soap | Jaws, lime squeezer |
| Decking, canal boat | Key bottoms, piano |
| Dishes, wooden | Knock, door |
| Display forms, hodlery | Knobs, furniture |
| Display forms, shoe | Kroutcutters |
| Door boards, coal car | Lastas |
| Door boards, railroad grain car | Leesboards, furniture |
| Dowels | Legs, billiard table |
| Dowels, parosak shanks | Legs, bread |
| Dumb waiters | Legs, curd grinding machine |
| Dewers | Legs, dresser |
| Everners | Legs, dressing table |
| Faucets | Legs, incubator |
| Fixtures, bar room | Legs, kitchen table |
| Fixtures, barber shop | Legs, table |
| Fixtures, curtain | Legs, washing machine |
| Fixtures, office | Lemon squeezers |
| Fixtures, store | Lime spreaders, gear woods |
| Flasks | Lining, piano case |
| Flooring, electric cars | Machine rolls |
| Flooring, engine car | Mallets |
| Flooring, freight car | Mallets, stone cutters’ |
| Flooring, freight car platform | Malmers, potato |
| scales | Masts, stake |
| Flooring, house | Middles, spool |
| Flooring, mine dump cars | Mine cars |
| Flooring, parquet | Miter boxes, wooden |
| Flooring, passenger elevator | Models |
| Flooring, railway car | Moulding, automobile |
| Frames, blueprint | Moulds, brick |
| Frames, box mattress | Moulds, butter |
| Frames, buck saw | Mounting blocks, cash register (electric cars) |
| Frames, clothes wringer | Mounting blocks, electrical apparatus |
| Frames, corn sheller | Novelties |
| Frames, cot | Orange racks |
| Frames, glass cutter | Orange sticks |
| Frames, spraying machine | Parlor bowls |
| Frames, ten pin setter | Partition, drawer |
| Frames, thrasher grain register | Patterns, hay press |
| Framework, farm machinery | Pedals, pipe organ |
| Friction blocks, derrick | Pin blocks, piano |
| Friction blocks, heisting engine | Pins, cartridge |
| Gear parts, automobile | Pins, clothes |
| Gear woods, threshing machine | Pins, pie rolling |
| Gauges, carpenters’ | Pins, roll |
| Guide strips, dumb waiter | Pipe, wooden water |
| Hammer boards, fours | Pipes, printers’ |
| Handle cross pieces, lawn mower | Pipes, rolling |
| Handles | Plans, printer |
| Handles, awl | Poles, curtain |
| Handles, broom | Poles, tent |
| Handles, brush | Poles, upender |
| Handles, butcher knife | Posts, bed |
| Handles, canthook | Posts, chair |
| Handles, clothes wringer | Posts, corn sheller |
| Handles, coal pick | Posts, dresser |
| Handles, coal piece | Posts, guide, freight elevator |
| Handles, cobble | Posts, piano |
| Handles, corkscrew | Posts, guide, passenger elevator |
| Handles, cross-cut saw | Posts, split bottom chairs |
| Handles, dust brush | Press rolls, paper mill machinery |
| Handles, fishing rod | Racks |
| Handles, hoe | Racks, curtain display |
| Handles, ice cream freezer | Racks, rug display |
| Handles, lawn rake | Racks, towel |
| Handles, mining pick | Racks, umbrella |
| Handles, paint brush | Rails, foot, automobile |
| Handles, peavy | Rails, mine car |
| Handles, piano | Reels, electric wire |
| Handles, roller (bit brace) | Reels, solder wire |
| Handles, screw driver | Refrigerators |
| Handles, shoe knife | |
MAPEL, SUGAR—Concluded.

Slats, bed
Sheds
Slides, extension table
Slides, table
Space bars, typewriter
Spools
Spoons, wooden cooking
Spoons, wooden mixing
Springs, mine
Sprues, foundry flash
Squeezers, lime
Staffs, flag
Staves, cement barrel
Stains, cooperage
Steel, Cooperage
Steering wheels, automobile
Sticks, dye
Sticks, flower
Straw carriers
Stretchers, foundry
Stretchers, chair
Strips, guide, elevator
Sweepers, carpet
Sweeping brushes
Swings, child's
Swings, porch
Tables, library
Tents

OAK, BLACK.

Flooring, wagon bodies

Cases, dental
Cases, optical
Cases, organ
Cases, water closet tank
Casing, door
Casing, pipe organ
Casing, window
Carpet
Ceiling
Center arms, split wood pulleys
Chair rail, house interior trim
Chairs, Morris, exterior
Chairs, silverware
Cabinets, house interior trim
Commodores
Corner heads, house interior trim
Corner blocks, house interior trim
Costumers
Coupling poles, light vehicles
Cross arms, telegraph poles
Cross ties, railroad
Deck beams, canal boat
Deck beams, motor boat
Deck beams, river craft
Deck beams, ship
Deck beams, yacht
Desks, school
Doors
Doors, chimneys
Doors, folding
Doors, sliding
Doors, storm
Draft timbers, freight cars
Draw beams, railroad
Drop gates, light delivery wagon body
Dust cap, house interior trim
Easel blackboards
End sills, freight car
Ends, bookcases
Eads, buffet
Eads, bureau
Eads, chifforobe
Eads, desk
Eads, dresser
Pollocks, wagon wheel
Ponders, ship
Pilots, house interior trim
Finish, boat
Fixtures, office (exterior)
Flat battens, house interior trim
Finishing
driving
Flooring, house
Foot rests, wagon

Thresholds
Throngs, tennis racket
Tongues, corn planter
Tongues, land roller
Tongues, wagon
Tops, table
Towel furniture
Toy tea pins
Toy tops
Traps, game
Traps, mouse
Treads, stair
Trucks
Trucks, handy
Truck sills, gas engine
Trucks, sliding seat (outrigger and racing shells)
Trunks
 Turning blocks
Trapeze
Tread, wood
Trencher
Walking blocks
Washboards
Washstands, exterior
Wheelbarrows
Wheelbarrows
Wheelbarrows
Wristplanks, piano
Wringers, clothes

OAK, RED.

Frames, agricultural implements
Frames, barge
Frames, buck saw
Frames, canal boat
Frames, collar door
Frames, cellar window
Frames, collapsible crate
Frames, door
Frames, engine cab
Frames, floor mill machinery
Frames, freight car
Frames, barrow
Frames, scow
Frames, ship
Frames, stove
Frames, window
Frames, yachting
Front doors, house
Front panels, light delivery wagons
FRONTS, china closets
Furniture, bedroom
Furniture, mission, exterior
Gear woods, milling machinery
Grilles, house interior trim
Grille work
Gunwales, row boat (round bottom)
Head blocks, house interior trim
Head casing, house interior trim
Headboard, oil barrels
Headings, slack cooperation
Holdbacks, river craft
Hold beams, ship
Hold beams, yacht
Hoops, slack cooperation
Hubs, light vehicle
Interior finish, house
Interior finish, trim, bar room
Intruments, row boat (round bottom)
Jambs, door
Keels, row boat, (round bottom)
Keels, canal boat
Keels, river craft
Keels, ship
Keels, yacht
Keelsons, canal boat
Keelsons, river boat
Acetate of lime  
Alcohol, wood  
Armor, backing, ship  
Armors, lining, ship  
Arms, chair  
Astragals, folding door  
Astragals, sliding door  
Baby tender, walking chairs  
Bak posts, chair  
Bucks, chair  
Bucks, church pew  
Backs, vacuum cleaner brush  
Balusters, stair  
Bars, wooden batten  
Base board, house interior trim  
Base blocks, house interior trim  
Base corners, house interior trim  
Base moulding, house interior trim  
Baseboards  
Basket parts  
Beams, coal car  
Beams, dining room ceiling  
Beams, plow  
Beater roll, paper mill machinery  
Bedposts  
Beds, bending  
Beds, light delivery wagon  
Bedecked  
Belt, light delivery wagon  
Bodies  
Benches, piano  
Benches, shop  
Bench, stop, house construction  
Blocks, brush  
Blocks, thermometer  
Plate rail, dining room  
Posts, bed  
Posts, bookcase  
Posts, buffet  
Posts, chair  
Posts, chimney  
Posts, desk  
Posts, dresser  
Posts, sideboard  
Pulpts, exterior  
Labels, magazine  
Rails, door  
Rails, stair  
Rails, table  
Rails, wood pulleys  
Risers, stair  
Rosettes, (stairway)  
Runners, sheigh  
Running boards, automobile  
Running boards, electric cars  
Sash  
Screens, door  
Screens, window  
Seats, chair  
Seats, water closet  
Shelves, book  
Shelves, china closet  
Shelves, mantel  
Shingles  
Shoe rails, stair  
Showcases  
Sideboards, exterior  
Sideboards, interior  
Sides, b illiard tables  
Sides, case  
Sides, push carts  
Sides, wagon  
Sill, door  
Sills, gasoline engine truck  
Sills, heavy wagon  
Sills, log car  
Sills, stone crusher  
Sills, wagon  
Sills, wood seat  
Sofas, exterior  
Spokes, cart wheel  
Spokes, light vehicle  

OAK, WHITE.  

Blocks, wagon brake  
Boats, row  
Bodies, automobile  
Bores, mine pit wagon  
Bodies, truck  
Boots, wagon  
Bodies, freight cars  
Boleters, heavy vehicle  
Boleters, heavy wagon  
Bottom boards, mine car  
Bottom rails, sash  
Bottoms, baggage truck  
Bottoms, delivery wagon  
Bottoms, ore car bodies  
Bottoms, wagon  
Bookcases, built-in  
Bookcases, sectional  
Book racks, revolving  
Booths, telephone  
Bows, buggy top  
Bows, carriage top  
Bows, lawn rake  
Bows, wagon top  
Boxes, block  
Boxes, blacking  
Boxes, plug tobacco  
Phones, telephone  
Boxes, wagon  
Braces, railway car  
Braces, railway car, frame  
Brackets, insulator  
Brackets, plate rail  
Brackets, telegraph pole  
Brackets, telephone  
Brake beams, heavy vehicle  
Break blocks, mine pit wagon  
Buffets  
Buffets, exterior  
Stanchions, canal boat  
Stanchions, river craft  
Stanchions, yacht  
Stands, Bible  
Stands, plant  
Stands, umbrella  
Staves, cement barrel  
Staves, oil barrel  
Staves, slack cooperage  
Staves, tight cooperage  
Stay bars, light delivery wagon  
Stems, row boat (flat bottom)  
Stem posts, row boat  
Stems, row boat (round bottom)  
Stem posts, row boat (round bottom)  
Stiles, door  
Stops, door, house interior trim  
Store fronts  
String boards, stair  
Stripes, weather  
Studding, leg car  
Sways, porch  
Tables  
Tables, extension  
Tables, sewing  
Tables, top  
Tambour doors, panel  
Thresholds, house interior trim  
Tillers, canal boat  
Top rails, sash  
Top s, table  
Toy furniture  
Toy tops, round  
Transoms, row boat (round bottom)  
Traps, incubator  
Traps, stair  
Veneer  
Veneer cores, piano cases  
Vents, window  
Wainscoting  
Wainscoting, cap, house interior trim  
Wainscoting, rail, house interior trim  
Washstands, exterior  
Window apron, house interior trim  
Window stool, house interior trim  

OAK, RED—Concluded.
OAK, WHITE. Continued.

Drawer fronts, office fixtures
Drawer sides
Drawers
Drop gates, light delivery
wagon body
Drop lids, desk
Drum lagging, hoisting engine
Dumb waiters, bodies
Dust cap, house interior trim
Electric cars, interior finish
End panels, dresser
End sills, freight car
End sills, locomotive tender
End sills, log car
Ends, church pew
Ends, mine car bodies
Ends, pit cars
Engine beams, freight cars
Evenings, barrow
External work, electric shoe
shining machine
Feeding platform, rock crushing
machinery
Fellows
Fellows, automobile wheel
Fellows, heavy vehicle wheel
Fence pickets
Fenders, boat
Fenders, river craft
File cases
Filing cases, sectional
Filliet, house interior trim
Finish, boat
Finish, interior engine cab
Fireless cookers, exterior
fixtures, bank
Fixtures, bar
Fixtures, barber shop
Fixtures, curtain
Fixtures, laboratory
Fixtures, office
Fixtures, store
Fixtures, store display
Flat battens, house interior
trim
Flooring, automotive bodies
Flooring, boats
Flooring, freight cars
Flooring, hardwood
Flooring, house
Flooring, light delivery wagon
Flooring, parquet
Foot rests
Foot stools
Forebays, flour mill
Furniture, agricultural imple-
ments
Frames, automobile bodies
Frames, large
Frames, bobsleds
Frames, canal boat
Frames, chair
Frames, coal screen
Frames, coal storage door
Frames, conch
Frames, davenport
Frames, dump carts
Frames, electric cars
Frames, electric switchboard
Frames, engine cab
Frames, freight car
Frames, grayl screens
Frames, hall clock
Frames, hand coffee mill
Frames, hand mirror
Frames, barrow
Frames, light vehicle
Frames, light vehicle body
Frames, lounge
Frames, mirror
Frames, mission hall clock
Frames, motor boat
Frames, picture
Frames, quarry car
Frames, river craft
Frames, sand shaking screen
Frames, scow
Frames, ship
Frames, surrey body
Frames, tobacco truck
Frames, truck body
Frames, truck sleigh
Frames, upholstered chair

Frames, upholstered furniture
Frames, vessel
Frames, wagon body
Frames, wood-boring machines
Frames, wood-saw
Frames, yacht
Front bolsters, wagon
Front doors, house
Front bounds, wagon
Front panels, light delivery
wagon
Fronts, china closet
Fronts, drawer
Fronts, dresser
Furniture, bank
Furniture, bar room
Furniture, barber shop
Furniture, case goods
Furniture, craftsman's
Furniture, drug store
Furniture, office
Furniture, store
Gates, freight elevator
Gear parts, wagon
Gear wood, light wagon
Grilles
Grilles, house interior trim
Guards, boat
Gunwales, boat
Gunwales, canoe
Gunwales, row boat, (round
bottom)
Hall mirror rat racks
Hall racks
Handles
Handles, axe
Handles, barrow
Handles, coal pick
Handles, coal shovel
Handles, cultivator
Handles, edge-tool
Handles, hand axe
Handles, machine
Handles, mattock
Handles, mop
Handles, paint brush
Handles, pick
Handles, planters' eye hoe
Handles, plow
Handles, push cart
Handles, railroad pick
Handles, saw
Handles, spading fork
Hand rails, river craft
Hats
Head blocks, house interior
trim
Head casing, house interior
trim
Heading, oil barrel
Heading, slack cooperage
Heading, light cooperage
Heading, whiskey barrel
Heel board, light delivery
wagon
High chair, child's
High holsters, wagon
Hind bounds, wagon
Hold beams, river craft
Hold beams, ship
Hold beams, yacht
Hoops, slack cooperage
Horns, phonograph
Hounds
Hounds, heavy wagon
Hounds, wagon
Hubs, heavy vehicle wheel
Hubs, push cart wheel
Hubs, wagon
Hulls, boat
Ice chest, outside finish
Interior finish
Interior finish, house
Interior finish, electric cars
Inwardly, row boat, (round bot-
tom)
Jamb, door
Joiners, deck
Keel blocks, boat
Keels, canal boat
Keels, motor boat
Keels, river craft
Keels, row boat (round bottom)
Keels, ship
Keels, yacht
OLIVWOOD

Stems, motor boat
Stems, river craft
Stems, ship
Stems, yacht
Steps, stairwork
Stem posts, canal boat
Stem posts, motor boat
Stem posts, river craft
Stem posts, row boats
Stem posts, row boats (round bottom)
Stem posts, ship
Stem posts, yacht
Stits, door
Stools, office
Stools, piano
Steps, door, house interior trim
Straw carriers, chair
Stretchers, table
Stringers, railway car
Studding, log car
Superstructure, lauches
Swap bars, wagon
Sweep sticks, boom
Sweep cleats, curtain pole
Swings, lawn
Swings, porch
Switchboards, telephone
Switch timbers, railroad
Tables
Table slides
Tables, billiard
Tables, dining
Tables, dressing
Tables, drop leaf
Tables, extension
Tables, folding

OAK, WHITE—Concluded

Tables, library
Tables, lunch room
Tables, parlor
Tables, sewing
Tables, tea
Tables, typewriter
Tables, writing
Tabourets
tail boards, wagon
Tank cases, water closet
Tanks
Tanks, brewery
Tanks, distilling
Tanks, diving (theatrical)
Thresholds
Thresholds, house interior trim
Tie beams, cars
Ties, railroad track
Tight cooperation stock
Tillers, canal boat
Tillers, river craft
Tongues, cultivator
Tongues, corn planter
Tongue hounds, wagon
Tongues, heavy wagon
Top rails, light delivery wagon bodies
Top rails (sash)
Top, chair
Top, counter
Top, dresser
Top, table
Top, wire frame tables
Toy furniture
Toy tops
Trays, jewelry display
Trays, sewing

OLIVEWOOD

Backs, clothes brush
Pipes, smoking

PEARWOOD

T-squares, drawing

PERSIMMON

Lasts, shoe

Shutters

PINE, LOBLOLLY

Ceiling, traction engine cars
Clapboards
Ceilings
Cores, veneer
Corbels
Cores, house construction
Crates, beer
Crates, cabbage
Crates, milk bottle
Cratling
Cross arms, telegraph pole
Cross-ties, railroad
Cupboards, built in
Decking, freight cars
Doors
Doors, freight car
Excellor
Excellor, packing
Excellor, ribbon (matress stuffing)
Faucet boards, freight cars
Fallow boards, foundry
Finishing
Fixtures
Fixtures, office
Fixtures, store
Flooring
Flooring, porch
Flooring, wagon bed
Frames, coal screens
Frames, door
Frames, gravel screen
Frames, passenger car
Frames, sand shaking screens
Frames, window
Fruit jar cases

Transoms, row boat (round bottom)
Treadle sticks, loom
Tree blocks, shoe
Truck bolters, freight car
Trucks
Trucks, freight car
Trucks, stevedore
Vats, beer
Vats, oil
Vehicle (gear parts)
Veneer
Veneer, furniture
Veneered doors, craftsman
Ventilators, window
Ventiment cases, church
Wagons, diamond drill
Winosecting
Winosecting caps, house interior trim
Winosecting (elevator cars)
Winosecting rail, house interior trim
Wall cases
Wardrobes (exterior)
Washers, fire escape construction
Washstands, exterior
Wedges, foundry
Wheels, water mill
Windlass frames, derrick
Window apron, house interior trim
Window screens
Window sills
Window stool, house interior trim

Backs, clothes brush
Pipes, smoking

Handles, brick trowel
Heads, golf clubs

Backing, furniture
Balusters (stair)
Barn boards
Batteens, o. g. barn
Beams, o. h. (elevator)
Beams, ship
Bevel cribbing
Blowers, organ
Blowers, player piano
Boat construction
Boards, lopping
Bottom rails, sash
Bottoms, bank fixtures
Bottoms, office fixtures
Bottoms, stove fixtures
Box shooks
Boxboards, heavy vehicles
Boxes
Boxes, bottle
Boxes, coffee
Boxes, dry goods
Boxes, feed cutter
Boxes, packing
Boxes, root cutters
Boxes, trunk
Boxes, weight (dumb waiter)
Boxes, weight (elevator)
Brackets, stair
Camelots
Car decking
Car siding
Cases, casket
Cases, clock
Cases, shipping
Caskets
Ceiling

Gates, freight elevator
Guide rails (dumb waiter)
Hand rails, stair
Heading, slack cooperation
Inclinator plans
Interior finish
Interior finish, house
Interior trim, house
Lath
Lining, dumb waiter shaft
Lining, freight cars
Lockers
Meeting rails, sash
Mouldings
Mouldings, bed, house construction
Moulding, crown, house construction
Moulding, crown, house construction
Moulding, picture
Mail boxes, sash
Newel posts, angle
Newel posts, starting
Nosing, interior house trim
Panels, door
Papers, pulp
Partition, house
Patterns (foundry)
Planking, ship
Platforms, carriage bolt
Platforms (elevator)
Poles, tent
Porch work
Rails, door
Rails, stair
LOBLOLLY PINE—Continued

Sheathing
Shelves, dumb waiter
Shelves, mantel
Shiplap
Shoe rails, stair
Sidewalks, wheelbarrow
Sides, cornsheeler
Slats, bed

Staves, slack cooperation
Stiles, door
String boards (stair)
Superstructure, electric cars
Top rails, sash
Treads, stair
Wainscoting
Weight boxes (elevator)

PINE, LONGLEAF

Cornice, house construction
Corner, veneer doors
Cores, veneer panels
Covers, ice freezing can
Covers, tank
Cradles, tank cars
Crate, caboose
Creating, porch roof
Cross-arms
Cross-ties, railroad
Deck beams, boat
Decking, freight cars
Decking, canal boats
Decking (ship and boat)
Derricks, oil well
Doors, dumb waiter shaft
Doors, folding
Doors, railway box cars
Doors, sliding
Dumb waiter
Dust cap, house interior trim
Elevators (freight)
Elevators (passenger)
Eveners
Fence braces, house construction
Fencing
Finish, house interior trim
Finish, boats
Finish, caboose interior
Fixtures, bar room
Fixtures, barber shop
Fixtures, cafe
Fixtures, laboratory
Fixtures, office
Fixtures, store
Flat battens, house interior trim
Flooring, automobile
Flooring, engine car
Flooring, freight cars
Flooring, freight elevators
Flooring, house
Flooring, locomotive tender
Flooring, passenger elevators
Flooring, porch
Flooring, refrigerator cars
Flooring, scale platforms
Footbridge pieces (elevator)
Forms, sewer
Frames, awning
Frames, barge
Frames, box car
Frames, coach
Frames, door
Frames, front door side light
Frames, log turners
Frames, motor boat hulls
Frames (passenger cars)
Frames, railroad snow plows
Frames, road scrapers
Frames, snow
Frames, store truck
Frames, window
Frame, freight car
Frame rail, porch
Front doors, house
Gable brackets, house construction
Gable ornaments, house construction
Grilles, house interior trim
Guides, mine shaft
Guide rails, dumb waiter
Gunwales, row boat (flat bottom)
Hand cars
Hardware, railway
Hand rails, stair
Hay barn, farm wagon
Hay ladders, farm wagon
Hay rake posts
Head blocks, boat

Head blocks, house interior trim
Head blocks, tank cars
Head casing, house interior trim
Header posts
Heading, slack cooperation
Ice boxes
Interior finish
 Jamie, door
Keel strips, row boat (flat bottom)
Keelsons, river craft
Keelsons, ship
Keelsons, yacht
Ladders, exterior
Ladders, step
Lath
Lattice
Lids, water closet
Lining cars
Lining, freight cars
Lining, light delivery wagon
Lining, box cars
Long sills, freight cars
Manets
Manure spreaders
Meeting rails (sash)
Mirror doors, house construction
Molding, bed, house construction
Molding, brick, house construction
Molding, cap, house interior trim
Molding, crown, house construction
Molding, drip cap, house construction
Molding, picture
Molding, plaster, house construction
Molding, quarter round
Molding, storm, house construction
Mountings, rock crushers
Nullions, sash
Needle beams (railway cars)
(Frames)
Never posts, angle
Never posts, starting
Nosing, house interior trim
Ornamental, furniture
Overhead beams, dumb waiter
Panel strips, house interior trim
Panels, door
Panels, stair work
Panels, veneered
Paper pulp
Parting strips, house interior trim
Partition, house
Partition moulds, house interior trim
Parts, milling machinery
Parts, railway motor cars
Panels, interior parts
Planning, boat
Planking, boat
Planking, canal boat
Plates, freight cars
Plate rail, dining room
Plates, electric car
Plates, freight cars
Plates, passenger cars
Platforms, freight elevator
Platforms, passenger elevator
Platforms, tank
Plugs, cross-tie
Plumber’s woodwork
Poles, farm implements
Poles, flag

Astragals, folding door
Astragals, sliding door
Backings, counters
Balusters, porch
Balusters, stair
Barn boards
Barge construction
Base blocks, house interior trim
Baseboards
Base board, house interior trim
Base corner, house interior trim
Base moulding, house interior trim
Bases, gasoline engine
Bathtub, dumb waiter
Batting, o. g. barn
Bay brackets, house construction
Beams, derrick
Beams, dining room ceiling
Beams, elevator
Bed, coal wagon
 Beds, light delivery wagons
Bevel cribbing
Bevel siding, house
Blind stops, house construction
Blinds, window
Blocking, railway tank cars
Bodjes, manure spreader
Bodjes, railway cars
Bodjes, sugar corn cars
Booms, river craft
Booms, ship
Bottom rails (sash)
Bottom rail, porch
Bottoms, dump cart
Bottoms, heavy vehicle
Bottoms, lawn swings
Bottoms, light wagon
Bottoms, push carts
Boxboards, dump carts
Boxes, wagon
Box shakes
Boxes, lime and fertilizer
Secures
Braces, freight car
Brackets, plate rail
Brackets, pole cart
Brackets, stair
Bridge poles (car)
Cabinet work
Cabinets (dental)
Cabinets, double
Cabinets, (toilet)
Cabinets, canals
Cabinets, exterior, river craft
Cabinets, exterior, ships
Cabinets, exterior, yachts
Captive
Caps, sink, house interior trim
Carpet strips, house interior trim
Cars, dumb waiter
Cars, elevator
Cart beds
Cases, china
Cases, medicine
Cases, tobacco
Casing, door
Casings, window
Celing
Chair rail, house interior trim
Chairs, dumb waiter
Climbing poles, gymnasium
Colonades, house interior trim
Compartments
Corner beads, house interior trim
Corner blocks, house interior trim
Corner posts, freight cars

Corners, wall (stair)
Crate, caboose
Credence, stew room
Cranes, floating
Cranes, freight
Crates, cabbages
Creating, porch roof
Cross-arms
Cross-ties, railroad
Deck beams, boat
Decking, freight cars
Decking, canal boats
Decking (ship and boat)
Derricks, oil well
Doors, dumb waiter shaft
Doors, folding
Doors, railway box cars
Doors, sliding
Dumb waiter
Dust cap, house interior trim
Elevators (freight)
Elevators (passenger)
Eveners
Fence braces, house construction
Fencing
Finish, house interior trim
Finish, boats
Finish, caboose interior
Fixtures, bar room
Fixtures, barber shop
Fixtures, cafe
Fixtures, laboratory
Fixtures, office
Fixtures, store
Flat battens, house interior trim
Flooring, automobile
Flooring, engine car
Flooring, freight cars
Flooring, freight elevators
Flooring, house
Flooring, locomotive tender
Flooring, passenger elevators
Flooring, porch
Flooring, refrigerator cars
Flooring, scale platforms
Footbridge pieces (elevator)
Forms, sewer
Frames, awning
Frames, barge
Frames, box car
Frames, coach
Frames, door
Frames, front door side light
Frames, log turners
Frames, motor boat hulls
Frames (passenger cars)
Frames, railroad snow plows
Frames, road scrapers
Frames, snow
Frames, store truck
Frames, window
Frame, freight car
Frame rail, porch
Front doors, house
Gable brackets, house construction
Gable ornaments, house construction
Grilles, house interior trim
Guides, mine shaft
Guide rails, dumb waiter
Gunwales, row boat (flat bottom)
Hand cars
Hardware, railway
Hand rails, stair
Hay barn, farm wagon
Hay ladders, farm wagon
Hay rake posts
Head blocks, boat
Head blocks, house interior trim
Head blocks, tank cars
Head casing, house interior trim
Header posts
Heading, slack cooperation
Ice boxes
Interior finish
Jamb, door
Keel strips, row boat (flat bottom)
Keelsons, river craft
Keelsons, ship
Keelsons, yacht
Ladders, exterior
Ladders, step
Lath
Lattice
Lids, water closet
Lining cars
Lining, freight cars
Lining, light delivery wagon
Lining, box cars
Long sills, freight cars
Mantels
Manure spreaders
Meeting rails (sash)
Mirror doors, house construction
Molding, bed, house construction
Molding, brick, house construction
Molding, cap, house interior trim
Molding, crown, house construction
Molding, drip cap, house construction
Molding, picture
Molding, plaster, house construction
Molding, quarter round
Molding, storm, house construction
Mountings, rock crushers
Nullions, sash
Needle beams (railway cars)
(_frames)
Never posts, angle
Never posts, starting
Nosing, house interior trim
Ornamental, furniture
Overhead beams, dumb waiter
Panel strips, house interior trim
Panels, door
Panels, stair work
Panels, veneered
Paper pulp
Parting strips, house interior trim
Partition, house
Partition moulds, house interior trim
Parts, milling machinery
Parts, railway motor cars
Panels, interior parts
Planning, boat
Planking, boat
Planking, canal boat
Plates, freight cars
Plate rail, dining room
Plates, electric car
Plates, freight cars
Plates, passenger cars
Platforms, freight elevator
Platforms, passenger elevator
Platforms, tank
Plugs, cross-tie
Plumber’s woodwork
Poles, farm implements
Poles, flag
PINE, LONGLEAF—Concluded

Shelves
Shelves, mantel
Shipboards
Shoe rails, stair
Shovels, coal
Shutters
Sideboards, built in
Side plates
Side plates (railway freight cars)
Sides, coal flats
Sides, dumb waiter
Siding
Siding, box cars
Siding, caiboose
Siding, freight car
Signboards
Signs, advertising
Silts, door
Silts, electric cars
Silts, freight car
Silts, railroad cars
Silts, window
Sills
Sink aprons, house interior trim
Slats, bed
Slats, railway cattle cars
Slide, fly screen
Snow boards, engine pilot
Spindles, porch
Stakes, gondola cars
Staves, silo
Staves, slack cooperage
Stems, canal boat
Step posts, row boat
Stops, door
Stools, door, house interior trim
Stops, window, house interior trim
String boards, stair

PINE, NORWAY

Flat battens, house interior trim
Flooring, freight cars
Frames
Frames, front door side light
Frames, window
Frieze rail, porch
Front doors, house
Gable brackets, house construction
Gable ornaments, house construction
Grilles, house interior trim
Head blocks, house interior trim
Heading, plate glass shipping cars
Jamb, door
Lattice
Mantels
Meeting rail, sash
Mirror doors, house
Moulding, bed, house construction
Moulding, brick, house construction
Moulding, cap, house interior trim
Moulding, cove
Moulding, crown, house construction
Moulding, drip cap, house construction
Moulding, picture
Moulding, plaster, house construction
Moulding, quarter round
Moulding, screen

PINE, PITCH

Boxes, soap
Corncrue, house construction
Crating
Flats, hay wagon

PINE, SCRUB

Flooring
Flooring, porch
Flooring, railway cars
Frames, door
Frames, front door side light
Frames, mirror
Frames, picture

Stringers, railway car
Studding
Supports, elevator
Supports, tank
Swings, lawn
Swings, porch
Tackle blocks
Tanks
Tanks, acid
Tanks, paper mill
Tanks, pickling
Thresholds
Thresholds, house interior trim
Tillers, canal boat
Tillers, river craft
Tongues, agricultural machinery
Tongues, farm machinery
Tongues, manure spreaders
Tongues, wagon
Top rail, porch
Top rails (sash)
Top, freezing tank
Top, head doors
Treads, stair

Upper belt rails (freight cars)
Upright, row boats (flat bottom)

Vats
Wahlscott rail, house interior trim
Wainscoting
Wainscoting, cap, house interior trim
Wall cases
Water tanks, railroad
Window apron, house interior trim
Window stool, house interior trim
Wire cloth display racks

Mouldings, spring, house construction
Mullions, sash
Nosing, house interior trim
Partitions, stop, house interior trim
Partition moulds, house interior trim
Panels, door
Panel strips, house interior trim
Plate rail, dining room
Porch columns, built up
Porch columns, solid
Porch newels, built up
Porch newels, solid
Porch, spandrels
Rails, door
Row stops, freight car
Scroll sawed balusters, porch
Sink aprons, house interior trim
Slide, fly screen
Swindles, porch
Stiles, door
Stops, door, house interior trim
Stools, window, house interior trim
Top rail, porch
Top rails, sash
Wahlscott rail, house interior trim
Wainscoting, cap, house interior trim
Window apron, house interior trim
Window stool, house interior trim

Flooring, house
Pallets, fire brick
Wainscoting, house construction

Frames, window
Paper pulp
Roofers
Running boards, electric car
Scroll sawed balusters, porch
Siding, barn
Thresholds

Bottom boards, farm wagon bodies
Box sheoks
Boxes, packing

Battens, o. g. barn
Box sheoks
Boxes, packing
Cases, packing
Casing, door
Casing, window
Crating
Exterior

Rails, door
Rails, river craft
Railway car construction
Reels, cable
Reels, wire rope
Refrigerators
Refrigerators, outside
Ridge poles, freight cars
Risers, stair
Risers, row boat (flat bottom)
Roof framing, silos
Roof ribs, freight cars
Roofing, box cars
Roofing, freight cars
Roofing, house
Rosettes, wall (stairway)
Rough houses, stair
Running boards, locomotive
Sash
Scabs
Scoops boards
Scows
Scraves, door
Scraves, window
Scroll sawed balusters, porch
Screen boards, light delivery wagon
Seats, rowboat
Seats, water closet
Scheathing

Balusters, porch
Base blocks, house interior trim
Base board, house interior trim
Base corners, house interior trim
Base moulding, house interior trim
Battens, o. g. barn
Bay brackets, house construction
Beans, dining room ceiling
Blind stops, house construction
Boards, round, porch
Bottom rail, sash
Brackets, plate rail
Brackets, porch
Crafts, locomotive
Capping, sink, house interior trim
Carpet strips, house interior trim
Casing, door
Casing, window
Chair rail, house interior trim
Colonades, house interior trim
Corner blocks, house interior trim

Consolades
Cresting, porch roof
Door battens, freight car
Doors, folding
Doors, sliding
Face brackets, house construction
Fillet, house interior trim
Flasks, foundry

Bottom boards, farm wagon bodies
Box sheoks
Boxes, packing

Battens, o. g. barn
Box sheoks
Boxes, packing
Cases, packing
Casing, door
Casing, window
Crating
Exterior
PINE, SHORTLEAF

Astragal, folding door 
Pantiles, arch 
Pantiles, key 
Battens, o. g. b. 
Bay brackets, house construction 

Flooring, porch 
Frames, cellar window 
Frames, cold storage doors 
Frames, door 
Frames, front door side light 
Frames, lead rollers 
Frames, lawn swings 
Frames, window 
Frame, freight cars 
Framing, passenger cars 
Frieze rail, porch 
Front doors, house 

Gable brackets, house construction 

Grilles, house interior trim 

Hand cards 
Hand rails (stair) 
Handles, mops 
Handles, wall brush 
Hatch covers, river craft 
Hatch covers, ship 
Hatch covers, yacht 
Head blocks, house interior trim 

Head casing, house interior trim 
Heading, slack cooperage 
Insulation (refrigerator cars) 
Jamb, door 
Keel strips, row boats (flat bottom) 

Ladders, river craft 
Ladders, ship 
Ladders, stop 

Lath 

Lining, box cars 
Lining (cars) 
Lining, railway car 
Lining, railway freight cars 

Mantels 

Meeting rails (sash) 
Mirror doors, house 

Moulding, bed, house construction 

Moulding, brick, house construction 

Moulding cap, house interior trim 

Moulding, cove 

Moulding, crown, house construction 

Moulding, drip cap, house construction 

Moulding, electric wire 

Moulding, quarter round 

Moulding, picture 

Moulding, plastic, house construction 

Moulding, screen 

Moulding, spring core, house construction 

Moul'man's (sash) 

Newel posts, angle 

Newel posts, starting 

Nosing, house interior trim 

Panels (door) 

Panels, stair work 

Panel strips, house interior trim 

Paper pulp 

Parting strip, house interior trim 

Partition, house 

Partition moulds, house interior trim 

Parts, butter workers 

Plate rail, dining room 

Planking, yacht 

Porch columns, built up 

Porch newels, solid 

Porch newels, solid 

Porch spandrel 

Props, clothes 

Rails (door) 

Reels, cable 

Reels, wire rope 

Refrigerators 

Risers, row boat (flat bottom) 

Roof boards, sash 

Roofing, box cars 

Roofing, freight cars 

Roofing, house 

Roofing, railway cars 

Roofing, railway freight cars 

Rosettes, wall (stairway) 

Rough horses (stairway) 

Sash 

Screens, door 

Screws, window 

Scroll sawed balusters, porch 

Seats, anteroome 

Seats, row boat 

Sheathing 

Sheathing, house 

Shelves, mantel 

Siding 

Shingles, porch 

Shingles, slack cooperage 

Stiles (door) 

Stops, door, house interior trim 

Stops, window, house interior trim 

String boards (stair) 

Strainers, railway cars 

Timbers, ship 

Top rail, porch 

Top rails (sash) 

Treads, stair 

Upholst're, row boat (flat bottom) 

Wainscoting 

Wainscoting cap, house interior trim 

Wainscoting, house interior trim 

Window apron, house interior trim 

Window stool, house interior trim 

Transoms, row boat 


PINE, SUGAR

Astragal, folding door 

Balusters, porch 

Base blocks, house interior trim 

Base board, house interior trim 

Base corners, house interior trim 

Base moulding, house interior trim 

Battens, o. g. b. 

Bay brackets, house construction 

Beams, dining room ceiling 

Blind stop, house construction 

Bottom rail, porch 

Bottom rails, sash 

Boxing, pipe organ 

Face brackets, house construction 

Fillet, house interior trim 

Flat battens, house interior trim 

Frames, door 

Frames, front door side light 

Frames, pipe organ 

Frames, window 

Frieze rail, porch 

Front doors, house 

Gable brackets, house construction 

Gable ornaments, house construction 

Grilles, house interior trim
PINE, SHORTLEAF—Concluded

Moulding, plaster, house construction
Moulding, quarter round
Moulding, screen
Moulding, spring cove, house construction
Nosing, house interior trim
Panel stops, house interior trim
Panels, door
Parting stop, house interior trim
Partition moulds, house interior trim
Plate rail, dining room
Porch columns, built up
Porch newels, solid
Porch spandrels
Rails, door
Scroll sawed balusters, porch
Silks, pipe organ
Sink aprons, house interior trim
Slide, fly screen
Spindles, porch
Stiles, door
Stops, door, house interior trim
Stops, window, house interior trim
Swelled rails, pipe organ
Top rail, porch
Top rails, sash
Wainscoting, cap, house interior trim
Wainscoting, cap, house interior trim
Wind chests, pipe organ
Window apron, house interior trim
Window stool, house interior trim

PINE, WESTERN YELLOW

Fillet, house interior trim
Flat battens, house interior trim
Frames, door
Frames, window
Frieze rail, porch
Front doors, house
Gable brackets, house construction
Gable ornaments, house construction
Grilles, house interior trim
Jamb, door
Head blocks, house interior trim
Head casing, house interior trim
Lattice Mantels
Mirror rails, sash
Mirror doors, house
Moulding, bed, house construction
Moulding, brick, house construction
Moulding, cap, house interior trim
Moulding, cove
Moulding, crown, house construction
Moulding, drip cap, house construction
Moulding, picture
Moulding, plaster, house construction
Moulding, screen

PINE, WESTERN WHITE

Doors, folding
Doors, sliding
Dust cap, house interior trim
Face brackets, house construction
Astragals, folding door
Astragals, sliding door
Balusters, porch
Base blocks, house interior trim
Base board, house interior trim
Base corners, house interior trim
Base moulding, house interior trim
Battens, o. g. barn
Bay brackets, house construction
Beans, dining room ceiling
Blind stop, house construction
Bottom rails, sash
Bottom rail, porch
Brackets, plate rail
Brackets, porch
Capping, sink, house interior trim
Carpet strips, house interior trim
Casing, door
Casing, window
Chair rail, house interior trim
Colonades, house interior trim
Console Corners blocks, house interior trim
Cresting, porch roof
Cross-ties, railroad
Dust cap, house interior trim
Face brackets, house construction
Pine, shortleaf—Concluded
Veneer, Colonial columns

PINE, WHITE—Continued.

Spindles, porches
Stop, door, house interior trim
Stop, window, house interior trim
Top rail, porch
Astragals, folding door
Astragals, sliding door
Backs, buffets
Backs, bureaus
Backs, china closets
Backs, mirror
Balusters, porches
Balusters (stair)
Base blocks, house interior trim
Base board, house interior trim
Base corners, house interior trim
Base moulding, house interior trim
Battens, e. g. barn
Bay brackets, house construction
Beams, dining room ceiling
Beams, light delivery wagon
Beds, sleigh beds
Bins, flour
Bins, grain
Bins, mill feed
Blind stop, house construction
Blinds, window
Blocks, toy wagon
Boards, drawing
Boards, lapping
Boats, row
Bodies, wagon
Bottom boards, coal flats
Bottom boards, barges
Bottom boards, foundry flanks
Bottom boards, row boat
Bottom boards, street car
Bottom rail, porch
Buttends, dredge
Buttends, farm wagon bodies
Bottoms, grape basket
Bottoms, leaf tobacco cases
Bottoms, threshing machine
Bottoms, toy wagons
Bottles, toy wheelbarrows
Box shooks
Box shooks, tobacco
Boxes, battery
Boxes, entomological
Boxes, packing
Boxes, plant
Boxes, glue
Boxes, trunk
Boxes, wood weight (elevator)
Brackets, plate rail
Brackets, porch
Brackets, stair
Brackets, telegraph pole
Brake locks, mine car
Breeders
Bull wheel carts, oil well machinery
Burs
BusheL crates
Cabin finish, canal boats
Cabinets, canal boats
Cabinets, exterior, river craft
Cabin exterior, ships
Cabin, exterior, yachts
Capping, sink, house interior trim
Cantilever strip, house interior trim
Cases, coffin
Cases, organ
Cases, packing
Cases, sample
Cases, tobacco
Cases, tool
Casing, door
Casing, window
Caskets, exterior
Chair rail, house interior trim
Cheese boxes
Cider mills
Colonial columns
Columnades, house interior trim
Consoles
Corner blocks, house interior trim
Cornice work
Crate
Crates, bee
Cylindrical, porch roof
Cross-ties, railroad
Decking, yacht
Decking, lumber-wafer shafts
Doors, fire
Doors, folding
Doors, freight cars
Doors, sliding
Doors, stable
Drain boards, sink
Dust cap, house interior trim
Dry, leaf tobacco cases
Excelsior
Cross arms, telegraph pole
Face brackets, house construction
Fact boards, freight cars
Filet, house interior trim
Flasks
Flat battens, house interior trim
Flooring
Flooring, carriage bodies
Flooring, collapsible crates
Flooring, engine cars
Flooring, freight cars
Flooring, incubators
Flooring, mine dump cars
Flooring, road scrapers
Folding frames, baby bath tubs
Forms, concrete
Frames, door
Frames, front door side light
Frames, mirror
Frames, picture
Frames, tobacco
Frames, window
Frieze rail, porch
Front doors, house
Gable brackets, house construction
Gable ornaments, house construction
Gables, house interior trim
Gable posts, elevator
Gunwales, boat
Hatch covers, canal boats
Hatch covers, river craft
Hatch covers, ship
Hatch covers, yacht
Head blocks, house interior trim
Heads, casing, house interior trim
Heading, plate glass shipping
Heads, light cooperation
Heading, slack cooperation
Hoppers, feed mill elevators
Hoppers, mill feed
Hoppers, floor
Hoppers, grain
Icing vats, dairymen’s
Interior finish, house
Instrument (railway refrigerator cars)
Jamb, door
Jamb (elevator)
Joiner bulkheads, ship
Joiners, deck (ship)
Keels, canal boat
Keels, river craft
Keels, ship
Keels, yacht
Lids, grape basket
Lining, cast iron pipe for coal
Lining, dumb waiter shafts
Lining, light delivery wagon
Window apron, house interior trim
Window stool, house interior trim

PINE, WHITE

Lining (railway box cars)
Lap siding, house
Lattice
Mantels
Matches
Mirror doors, house
Models, machine
Moulding, brick, house construction
Moulding, brick, house construction
Moulding, cloth, house construction
Moulding, plastic, house construction
Moulding, quarter round
Moulding, screen
Moulding, spring cove, house
Moulding, trim
Moulds, brick
Moulds, foundry
Newel posts, angle
Newel posts, starting
Nosing, house interior trim
Organs, interior parts
Pails, candy
Panel strips, house interior trim
Panels, stair work
Panels, wagon bodies
Paper pulp
Parquet flooring, house interior trim
Partition moulds, house interior trim
Patterns
Patterns, rubber factory
Pipe organs, interior parts
Pipes, organ
Planking, barge
Planking, river craft
Planking, sash
Planking, ship
Planking, yacht
Plate rail, dining room
Porch columns, built up
Porch columns, solid
Porch newels, built up
Porch newels, solid
Porch spandrels
Posts, elevator
Preserves, cider
Props, clothes
Rails, stair
Reels, cable
Rheels, wire rope
Risers, stair
Rollers, land
Rooftop strip, freight car
Rosettes, wall (stairway)
Rough horses, stair work
Rudders, river craft
Rudders, ship
Rudders, yacht
Running belts
Scows, coal
Scows, sand
Scots boards, light delivery wagon
Seats, row boat
Sheelves, dumb-waiter
Shelving
Shoe rails (stair)
Sides (dumb-waiter)
Sides, engine cabs
Sides, farm wagon bodies
PINE, WHITE—Continued

Stakes, surveyor’s
Staves, slack cooperation
Stools, bench
 Stops, door, house interior trim
 Stops, window, house interior trim
 Strings, fronts
 String boards (stair)
 Taffy sticks, confectioners’
 Tanks
 Templates
 Tool boxes, stone crusher
 Top rail, porch
 Top slats, light delivery wagon bodies
 Tops, leaf tobacco cases

POPLAR, YELLOW

Boxes, weight (elevator)
Braces, boat wheel
Brackets, plate rail
Brackets, porch
Brackets, stair
Brushes, dust
Bungs
Bustins
Butter workers, dairyman’s
Cabinets
Cabinets, dental
Cabinets, medicine
Cabinets, scale
Cabinets, towel
Cabinets, type
Cabinets, canal boats
Cabinets, exterior, river craft
Cabinets, exterior, ships
Cabinets, exterior, yachts
Car parts, automotive
Cabs, locomotive
Capping, sink, house interior trim
Carpet strips, house interior trim
Carts, ensilage
Cases, blacking
Cases, casket
Cases, clock
Cases, dental
Cases, liquor
Cases, optical
Cases, packing
Cases, silverware
Casing
Casing, door
Casing, window
Ceiling
Celing, boats
Chair rail, house interior trim
Chairs, barber
Chairs, kitchen
Chests, organ
Chiffoniers
China cabinets, interior
Cigar boxes
Cloth soles (shoes)
Collins
Colonial columns
Colonnades, house interior trim
Commodities
Compartments, trunk
Consoles
Cores, veneer
Corner blocks, house interior trim
Cornice
Costumers
Counters, store
Crates, beer
Crates, fruit and vegetable
Crates, mineral water
Cruet, porcelain roof
Cupboards, kitchen
Cushion frames, vehicle
Doors
Desks, interior work
Display forms, boxes
Display forms, shoe
Doors, folding
Doors, sliding
Drawers, interior
Drain boards, sink
Drawers
Drip boards

Toy carts
Toy furniture
Treads, stair
Trunks
Vats
Wainscot rail, house interior trim
Wainscoting cap, house interior trim
Wheels, water mill
Wind chimes, pipe organ
Window apron, house interior trim
Window stool, house interior trim
Work boards, bar room

Dust cap, house interior trim
Elevators, corn
Elevators, flour mill
Electric cars, interior finish
Excelsior
Excelsior, packing
Excelsior, ribbon (mattress stuffing)
Face brackets, house construction
Faucets
Filler, house interior trim
Finish, boats
Forks
Fixtures, bank
Fixtures, bar
Fixtures, display windows
Fixtures, laundry
Fixtures, office
Fixtures, store
Flasks, foundry
Flat battens, house interior trim
Foot boards, wagon
Front panels, light delivery wagons
Fronts, kitchen cabinets
Frames, billiard table
Frames, camera
Frames, coal stoves
Frames, davenport
Frames, door, house construction
Frames, mirror
Frames, lounges
Frames, organ interior
Frames, picture
Frames, upholstered furniture
Frames, window
Frieze rail, porch
Front doors, house
Furniture, interior
Furniture, inside
Gates, farm
Gable brackets, house construction
Gable ornaments, house construction
Grain drills, parts
Grilles, house interior trim
Hand rails, porch
Handles, machine brushes
Head blocks, house interior trim
Head casing, house interior trim
Head parts
Holders, Christmas tree
Hopper, flour mill machinery
Ice boxes
Interior finish, house
Interior finish, pipe organ
Jambs, door
Jambs (elevator)
Keels, boat
Key bottoms, piano
Lath
Lids, water closet
Lining, light delivery wagons
Lining, refrigerator
Lining, telephone boxes
Litter carriers
Lodge furniture
Mantels
Mantels (painted wood)
Meeting rails (sash)
Mirror doors, house
Mixers, dough
Models
Moulding, bed, house construction
Moulding, brick, house construction
Moulding, cap, house interior trim
Moulding, cove
Moulding, crown, house construction
Moulding, drip cap, house construction
Moulding, plane case
Moulding, picture
Moulding, plaster, house construction
Moulding, porch
Moulding, quarter round
Moulding, screen
Moulding, spring cove, house construction
Music cabinets, interior
Mullions (sash)
Novelties
Newel posts, angle
Newel posts, starting
Organ parts, interior
Outside finish (electric cars)
Packing cases
Paddle wheels, excursion boats
Palls, running
Panel strips, house interior trim
Panel sides, passenger cars
Panels, veneer
Panel work, wagon sides
Paper pulp
Panels, automobile bodies
Panels, auto-truck bodies
Panels, carriage bodies
Panels, coach
Panels, delivery wagon
Panels (door)
Panels, furniture sides
Panels, light wagon bodies
Panels, stair work
Panels, truck sleigh bodies
Panels, vehicle bodies
Panels, wagon bodies
Parting strip, house interior trim
Partitions
Partitions, wagon
Parts, cider mill
Parts, flour mill machinery
Parts, railway motor cars
Passenger cars, interior work
Patterns
Pedestals
Peeled blades
Pine, parts, interior
Plasterers, mantel

Pins, clothes
Pipe organs, interior parts
Pipes, organ
Pipes (pipe organ)
Plate rail, dining room
Poles, yarn
Pool tables, hidden work
Porch blinds
Porch columns, built up
Porch columns, solid
Porch newels, built up
Porch newels, solid
Post caps
Porch spindle
Posts (elevator)
Posts, porch
Pulpits, church
Pumps
Quilt boards
Racks, display
Racks, roller towel
Rails (door)
Rails, porch
Rails, stair
Rails, table
Reed organs, interior parts
Reels, electric wire
Reels, folder wire
Refrigerators
Refrigerators, exterior
Rims, split wood pulleys
 Risers, stair
Rollers, farm machinery
Rosettes, wall (stairway)
Ruling machines, bookbinders'
Running boards, automobile
Sash
Screens, door
Screens, window
Scroll saved balusters, porch
Seat backs, buggies
Seats, buggy
Seats, automobile
Seats, car
Seats, carriage
Seats, water closet
Sewing machine parts
Shelves
Shelves, book
Shelves, cabinet
Shelves, dental case
Shoe rails (stair)
Show cases
Shutters
Sideboards, built in
Sides, drawer
Sides, farm machinery
Sides, flour mill machinery
Sides, threshing machine
Sides, wagon bodies
Sides, wagon box
Siding
Siding, house
Siding, passenger cars
Siding, railway freight cars
Sildings (wagon beds)

Rattan
Stocks, whip

Reed
Stocks, whip

Redwood
Astragals, folding door
Balusters, porch
Base blocks, house interior trim
Base board, house interior trim
Base corners, house interior trim
Base moulding, house interior trim
Bay brackets, house construction
Beams, dining room ceiling
Bevel siding, house
Bottom rail, porch
Brackets, porch
Brackets, porch rail

Pins, clothes
Pipe organs, interior parts
Pipes, organ
Pipes (pipe organ)
Plate rail, dining room
Poles, yarn
Pool tables, hidden work
Porch blinds
Porch columns, built up
Porch columns, solid
Porch newels, built up
Porch newels, solid
Post caps
Porch spindle
Posts (elevator)
Posts, porch
Pulpits, church
Pumps
Quilt boards
Racks, display
Racks, roller towel
Rails (door)
Rails, porch
Rails, stair
Rails, table
Reed organs, interior parts
Reels, electric wire
Reels, folder wire
Refrigerators
Refrigerators, exterior
Rims, split wood pulleys
Risers, stair
Rollers, farm machinery
Rosettes, wall (stairway)
Ruling machines, bookbinders'
Running boards, automobile
Sash
Screens, door
Screens, window
Scroll saved balusters, porch
Seat backs, buggies
Seats, buggy
Seats, automobile
Seats, car
Seats, carriage
Seats, water closet
Sewing machine parts
Shelves
Shelves, book
Shelves, cabinet
Shelves, dental case
Shoe rails (stair)
Show cases
Shutters
Sideboards, built in
Sides, drawer
Sides, farm machinery
Sides, flour mill machinery
Sides, threshing machine
Sides, wagon bodies
Sides, wagon box
Siding
Siding, house
Siding, passenger cars
Siding, railway freight cars
Sildings (wagon beds)

Sidings, wagon
Sink aprons, house interior trim
Slide, fly screen
Springs, boat
Spindles, porch
Spools
Sprouting, flour mill
Staging, boats
Staves, cement barrels
Staves, slack cooperage
Steps, stop ladder
Stiles, door
Steps, door, house interior trim
Steps, window, house interior trim
Straw carries
String boards (stair)
Strips, weather
Tables, cape
Tables, dining
Tables, enameled library
table, kitchen
Tables, lunch room
Tabourettes
Top boards (pipe organs)
Top rail, porch
Top rails (sash)
Top slate, light delivery wagon bodies
Tons, table
Toy carts
Toy furniture
Toy tope
Toy wagons
Transoms, row boat
Trops, house
Traveling cases
Trays, trunk
Treads, stair
Troughs, bakers’
Trunk boxes
Type cases
Upper panels, light delivery wagon bodies
Vegetable slicers
Veneer
Veneer cores, organ cases
Veneer cores (piano cases)
Veneer crossbanding
Wainscot rail, house interior trim
Wainscoting, outside (railway cars)
Wainscoting cap, house interior trim
Walkers, baby
Wardrobes
Wardrobes, inside finish
Wheelbarrows
Wheel apron, house interior trim
Window stool, house interior trim
Wood pulleys
Wood rolls, paper mill machinery
REDWOOD—Concluded.

Molding, bed, house construction
Molding, brick, house construction
Molding, cap, house interior trim
Molding, cove
Molding, crown, house construction
Molding, drip, cap, house construction
Molding, picture
Molding, plaster, house construction
Molding, quarter round
Molding, screen
Molding, spring cove, house construction

Backs, clothes brush
Backs, hair brush
Backs, nail brush
Blocks, brush
Bottles stoppers
Chairs, policeman

Knees, row boat
Knees, river craft

Balusters (stair)
Bevel siding, house
Bodies, electric cars
Bodies, railway cars
Booms, river craft
Booms, ship
Bottom boards, barge
Bottom boards, foundry
Boat boards, row boat
Bottom boards, scow
Bottom rail, sash
Boxes, bottle
Boxes, packing
Brackets, stair
Bridges, piano
Cases, packing
Ceiling, ship cabin
Cornice, house
Crating
Cross arms, telegraph pole
Cross-ties, railroad
Diagonal sweeps, piano
Basses, school blackboard
Planks
Planks, foundry
Flooring, electric cars
Flooring, freight cars
Flooring, mine dump cars
Flooring, railway passenger cars
Frames, blackboard
Frames, cold storage door

Nosing, house interior trim
Panel strips, house interior trim
Parting stops, house interior trim
Patterns
Plate rail, dining room
Porch columns, built up
Porch columns, solid
Porch newels, built up
Porch newels, solid
Porch spandrels
Ruling machines, bookbinders
Screen, door
Screen, window
Scroll sawed balusters, porch
Shade hangers

Frames, mirror
Frames, picture
Gavels
Handles, drawing instruments
Handles, surgical instruments
Levels, masses

Panels, automobile bodies
Parts (automobile bodies)
Pilot wheels, ship
Pilot wheels, yacht
T-Squares (drawing)

Knees, ship

SASSAFRAS.

Frames, drawing instruments
Handles, drawing instruments
Handles, surgical instruments

Planks, canoe
Planking, canoe
Planking, railway cars
Planking, scow
Poles, font
Rails, stair
Reels, cable
Reels, wire rope
Refrigerators
Ribs, piano
Risers, row boat (flat bottom)
Risers, stair
Rosettes, wall (stairway)
Rough horses (stairway)
Running boards (electric cars)
Sash, window
Sash, window
Siding, freight car
Sides, mine dump cars
Sides, row boat
Sounding board ribs, piano
Sounding boards, piano
Spars (ship)
Staves, tight cooperage
Stays, boat
String boards (stair)
Studding (ship building)

SPRUCE.

Frames, drawing instruments
Handles, drawing instruments
Handles, surgical instruments

Planking, canoe
Planking, railway cars
Planking, scow
Poles, font
Rails, stair
Reels, cable
Reels, wire rope
Refrigerators
Ribs, piano
Risers, row boat (flat bottom)
Risers, stair
Rosettes, wall (stairway)
Rough horses (stairway)
Running boards (electric cars)
Sash, window
Sash, window
Siding, scow
Sides, mine dump cars
Sides, row boat
Sounding board ribs, piano
Sounding boards, piano
Spars (ship)
Staves, tight cooperage
Stays, boat
String boards (stair)
Studding (ship building)

SPRUCE, SITKA.

Base blocks, house interior trim
Base board, house interior trim
Base cornice, house interior trim
Base moulding, house interior trim
Beams, dining room ceiling
Blind stops, house construction
Bottom rails, porch
Brackets, plate rail
Capping, sink, house interior trim
Carpet strip, house interior trim
Casement, window
Chair rail, house interior trim
Colonades, house interior trim
Corner blocks, house interior trim
Cornice work, house
Cresting, porch roof

Decking, boat
Doors, folding
Doors, sliding
Door stops, house interior trim
Frame, house interior trim
Flat battens, house interior trim
Frames, door
Frames, front door side light
Frames, window
Frieze rail, porch
Frieze, doors, house
Gable brackets, house construction
Hinges, black, house interior trim
Head casing, house interior trim
Jambs, door
Keels, boat
Mirror doors, house

Moulding, bed, house construction
Moulding, cap, house interior trim
Moulding, cove
Moulding, crown, house construction
Moulding, drip, cap, house construction
Moulding, picture
Moulding, quarter round
Moulding, springs, cove, house construction
Nosing, house interior trim
Panel strips, house interior trim
Paring stops, house interior trim
Parition moulds, house interior trim

Parting stops, window, house interior trim
Store fronts
Top rail, porch
Trays, fireplace
Wainscot rail, house interior trim
Wainscoting cap, house interior trim
Window apron, house interior trim
Window stool, house interior trim
Porch columns, built up
Porch columns, solid
Porch newels, built up
Porch newels, solid
Porch spandrels
Scroll sawed balusters, porch
Seats, boat
Siding, house
Sink aprons, house interior trim
Slide, fly screen
Spar, ship

Base blocks, house interior trim
Base board, house interior trim
Base corners, house interior trim
Base moulding, house interior trim
Basket parts
Baskets, fruit
Baskets, vegetable
Beams, dining room ceiling
Blind stop, house construction
Blocks, butcher
Boat parts
Bottoms, drawer
Boxes, packing
Boxes, plug tobacco
Brackets, plate rail
Buckets
Cabinet work
Cabinets, interior, ships
Cabinets, interior, yacht
Capping, sink, house interior trim
Carpet strip, house interior trim
Cases, reel organ
Casing, door
Casing, window
Chair rail, house interior trim
Chairs
Colonades, house interior trim
Consoles
Cooperage stock
Corner blocks, house interior trim
Crating
Doors, folding

Base blocks, house construction
Base board, house interior trim
Base corners, house interior trim
Base moulding, house interior trim
Beams, dining room ceiling
Blind stop, house construction
Blocks, plate rail
Capping, sink, house interior trim
Carpet strip, house interior trim
Casing, door
Casing, window
Chair rail, house interior trim
Ceiling, house interior trim
Colonades, house interior trim
Corner blocks, house interior trim
Cross-eyes, railroad
Doors, folding
Dust cap, house interior trim
Excelsior
Fillet, house interior trim
Flat battens, house interior trim
Flooring, boat
Flooring, house
Frames, door

Armour backing, ship
Armour blocking, ship

SPRUCE SITKA—Concluded.

Spindles, porch
Steps, door, house interior trim
Steps, window, house interior trim
Top rail, porch
Wainscoting cap, house interior trim
Wainscoting rail, house interior trim

Window apron, house interior trim
Window stool, house interior trim

Poles, tent
Rails, stair
Reels, cable
Reels, wire rope
Refrigerator
Ribs, piano

SUMACH.
Inlaid wood, furniture

SYCAMORE.

Doors, sliding
Dust cap, house interior trim
Fillet, house interior trim
Fixtures, office
Fixtures, store
Flat battens, house interior trim
Frames, door
Frames, front door side light
Frames, window
Front doors, house
Furniture, case goods
Gable ornaments, house construction
Grilles, house interior trim
Handles, hook
Handles, rake
Handles, saw
Head blocks, house interior trim
Head casing, house interior trim
Hoppers, fruit
Hoppers, vegetable
Jambs, door
Lath
Mantels
Mantle blocks
Mirror doors, house
Mouldings, bed, house construction
Mouldings, brick, house construction
Moulding, cap, house interior trim
Moulding, cove
Moulding, crown, house construction
Moulding, picture

TAMARACK.

Frames, front door side light
Frames, window
Front doors, house
Grilles, house interior trim
Head casing, house interior trim
Head blocks, house interior trim
Jambs, door
Knees, boat
Knees, canal boat
Knees, river craft
Knees, ship
Knees, yacht
Lath
Mirror doors, house
Moulding, bed, house construction
Moulding, cap, house interior trim
Moulding, cove
Moulding, crown, house construction
Moulding, picture
Moulding, quarter round
Moulding, spring cove, house construction
Nosing, house interior trim

Windows, screen
Window apron, house interior trim
Window stool, house interior trim

Partitions, built in
Partitions, wall panel
Partitions, window

Partition moulds, house construction
Partitions, wall panel
Price, window

Porch rail, house interior trim

Wainscoting cap, house interior trim
Window apron, house interior trim
Window stool, house interior trim

Wainscoting, house interior trim

Veneer
Venetian blinds

TEAKWOOD.

Cabinets, interior, ship
Cabinets, interior, yacht

Rails, yacht
Rails, ship building
Cigar boxes

WALNUT, BLACK.

Covers, switch box, Pullman coaches
Cupboard doors, Pullman coaches
Dash boards (automobile)
Deck boards, automobile
Deck chairs
Doors, sliding
Doors, folding
Doors, upper birth (sleeping cars)
Dining cap, house interior trim
Filet, house interior trim
Finish, interior (automobile bodies)
Flat battens, house interior trim
Flooring, parquetry
Foot rests
Foot stools
Fore ends, gun
Frames, mirror
Frames, picture
Furniture, church
Grilles, house interior trim
Grilles, pullman coaches
Hall mirror hattracks
Handles, rolling pin
Handles, saddlers' tool
Hand rails, stairway
Head casing, house interior trim
Heads, carpenter squares
Heads, T-squares (draftsman)
Interior finish, Pullman cars
Legs, piano
Lunch tables, portable, pullman cars
Couches, mirror doors, house
Mirror frames, pullman coaches
Molding, bed, house construction
Molding cap, house interior trim
Molding picture
Molding, quarter round
Molding, screen
Molding, spring cove, house construction
Mouldings, piano
Music shelf, piano
Nosing, house interior trim
Panel strips, house interior trim
Panel wainscoting, Pullman coaches

WALNUT, CIRCASSIAN.

Chiffoniers, exterior
Dash boards, automobile
Fore ends, gun
Frames, picture
Panels, bedstead

WEICHSEL ROOTS.

Handles, umbrella

WILLOW.

Pulps, candy

Pulp, paper
Agricultural Implements

Hertzler & Zook Co., Belleview
The A. E. Gaston Co., Cochranton
Nonpareil Mfg. Co., Cochranton
A. G. Anshey's Sons, Codorus
Ingersoll & Baker Agricultural Co., Doylestown
Hobson & Co., Easton
A. Buck's Sons Co., Elizabethtown
Theo. J. Ely Mfg. Co., Erie
George T. Sellers, Gap
Hamburg Flow Works, Hamburg
Hanover Bending and Mfg Co., Hanover
Musser Lbr. Co., Marletta
J. H. Albright & Sons, Millburn
Mountville Mfg. Co., Mountville
Miller Mfg. Co., Meyersdale
Weaver & Co., New Oxford
J. W. Conner & Orgeville
C. P. Fox, Perkasie

Baskets and Venner Packages for Fruit and Vegetables

Pape-Grail Wood Products Co., Brockwayville
Pease & Connell, Connantville
J. B. Steel & Co., Connersport
W. R. Wilcox, Lawrenceville

Boards—Cloth, Hosiery, Etc.

A. H. Balletter, Allentown
J. T. Hammond & Son, Inc., 4234 Hedge St.,
Frankford Sta., Philadelphia
Herman Miller, 214-216 W. Dauphin, Philadelphia

Boots and Shoe FINDINGS

George E. H. Halliwell, 2431 Kensinght Ave.,
Philadelphia
Philadelphia Last and Pattern Co., 216-18 Cherry St., Philadelphia

Boxes and Crates, packing

Geo. M. Wechter, Akron
Allentown Packing Box Co., Allentown
Allentown Reed, Harness and Mill Supply Co.,
Bellefonte
The Yeager Furniture Co., Allentown
Penn. R. R. Co. (Foundries), Altoona
The Antioch Co., Ardmore
Ingersoll Rand Co., Athens
Beaver Falls Planing Mill Co., Beaver Falls
J. L. McLaughlin & Sons, Bedford
Bullock Swing and Chair Mfg. Co., Inc., Bellefonte
P. B. Criddle & Son, Bellefonte
Penn. Match Co., Bellefonte
Blairsilve Emasated Ware Co., Blairsilve
Columbia Plate Glass Co., Blairsilve
James Gardner, Jr., Co., Bollivar
West Penn Steel Co., Brackenridge
Braddock Machine and Mfg. Co., Braddock
Pitts Machine Tool Co., Braddock
Biaselli Machinery Co., Bradford
Consolidated Window Glass Co., Bradford
I F. March's Sons, Bridgeport
Bristol Patent Leather Co., Bristol
Standard Cast Iron Pipe and Foundry Co.,
Bristol
Brockway Machine Bottle Co., Brockwayville
Greer & Garroway, Butler
Pittsburgh Hickson Co., Butler
Standard Plate Glass Co., Butler
Phoenix Novelty Co., Cambridge Springs
Nauf Cedar Co., Canonsburg
Thomson Patent Mfg. Co., Canton
Minnequa Furniture Co., Canton
American Welding Co., Carbondale

Sal. L. Allen & Co., Fifth St. & Glenwood Ave.,
Philadelphia
Pennsylvania Lawn Mower Co., Thirty-first &
Chestnut Sts., Philadelphia
Hardey & Excolator Co., Picture Rocks
Ellis Keystone Agr.Works, Pottstown
J. T. Zerbe, Reamstown
Wm. H. Fisher, Lebano
Noah C. Stabley, Red Lion
Messinger Mfg. Co., Tatamy
Frank A. Rockwell, Tropic
Frick Co., Waynesboro
John A. Hart, West Lebanon
A. B. Farquhar Co., Ltd., York
Hench & Dromgold, York
Keystone Farm Machine Co., York
The Micawber Mfg. Co., York
York Novelty Co., York

S. L. Allen & Co., Carbondale
H. Adler Co., Carnegie
Superior Steel Co., Carnegie
A. C. Kelly, Center Moriches
C. B. Curry & Son, Center Road Sta.
Chambersburg Engineering Co., Chambersburg
Geo. A. Miller Mfg. Co., Chambersburg
Pittsburgh Plate Glass Co., Charleroi
American Steel Foundries, Chester
Federal Steel Foundry Co., Chester
James M. Hamilton, Chester
Davis Lumbar and Planing Mill, Christians
Garhart Knitting Machine Co., Clearfield
Harbison Walker Refractories Co., Clearfield
Penn Iron and Steel Co., Coatesville
Freed Hester Co., Inc., Coatesville
The Keeley Store Co., Columbus
N. H. Goodsell, Connersport
Penn Furniture Co., Connersville
Shamburg & Allen Mch. Co., Coraopolis
Pittsburgh Plate Glass Co., Creighton
Dallastown Furniture Co., Dallastown
Merchant Cigar Box Co., Dallastown
Furneems Steam Cigar Box Factory, Dallastown
H. L. Hoise, Denver
Downingtown Mfg. Co., East Downingtown
Hosbon & Co., Easton
Pittsburgh Meter Co., East Pittsburgh
Westinghouse Elec. and Mfg. Co., East Pittsburgh
Westinghouse Machine Co., East Pittsburgh
C. E. Myers, East Prospect
The Edgy Mfg. Co., Eddystone
Tindel-Morris Co., Eddystone
C. Prouty & Co., Eldred

12

W. G. Woodruff, 3017 N. Lambert St., Philadelphia

John P. Little Co., Picture Rocks American Steel Foundries, Thirty-sixth St. and A. V. Ry., Pittsburgh

American Window Glass Co., Farmers' Bank Building, Pittsburgh

Anchor Rex and Lumber Co., 112 Lincoln Ave., Pittsburgh

Axthelm Mfg. Co., 242 Third Ave., Pittsburgh

Briggs Machinery Co., 233 Second Ave., Pittsburgh

A. M. Carrow Co., Penn and Third St., Pittsburgh

The Cuttle-Fulton Mfg. Co., 28-34 Penn Ave., Pittsburgh

Conroy Fruch Co., 1420-26 Western Ave., N. S., Pittsburgh

Crescent Bottle Co., Pittsburgh

D. O. Cunningham Glass Co., Twenty-second and Jane St., S. S., Pittsburgh

Dauler, Close & Jones, 636 Smithfield St., Pittsburgh

John Dunlap Co., P. O. Box 1023, Pittsburgh

Eiler Lumber and Mill Co., S. Twenty-third St., Pittsburgh

Eppinger Carpenter Co., Forty-first and A. V. Ry., Pittsburgh

Fawcette Machine Co., 2828 Smallman St., Pittsburgh

Getty Fender & Sons, 273 Woodville Ave., Pittsburgh

Benedict Gloekler Co., 1127-29 Penn Ave., Pittsburgh

Iron City Sanitary Mfg. Co., 1514 Oliver Blvd., Pittsburgh

F. J. Kress Box Co., 2920 Liberty Ave., Pittsburgh

McCready & Teoey Co., 48th St. and A. V. Ry., Pittsburgh

Macleb-Evans Glass Co., 416 Liberty Ave., Pittsburgh

The Marine Mfg. and Supply Co., Water St., Pittsburgh

The Morris and Bailey Steel Co. at Wilson, Pennsylvania

Mortimer Glass Co., 460 Lewis Blvd., Pittsburgh

Phoenix Glass Co., P. O. Box 727, Pittsburgh

Piccaro Macaroni Co., 178-187 Forty-first St., Pittsburgh

H. K. Porter Co., 45th St. and A. V. Ry., Pittsburgh

Richardson Mfg. Co., 55-57 Progress St., Pittsburgh

F. P. Schellein Machine Co., 32 W. Parkway, Pittsburgh

A. F. Schwerd Mfg. Co., 145 McClure Ave., N. S., Pittsburgh

Sigwart & Roisten Mch. Works, Cor. Garrison Ave. and Lake Avenue, Pittsburgh

The Simonds Mfg. Co., Twenty-fifth and Liberty St., Pittsburgh

Sommerfeld Machine and Mfg. Co., 208 Second Ave., Pittsburgh


U. S. Sanitary Mfg. Co., Pittsburgh

Federated Glass Co., Point Marion

Jeanette Window Glass Co., Point Marion

The Morris Glass Co., Point Marion

Point Marion Window Glass Co., Point Marion

Allegheny Glass Co., Point Allegheny

Mississippi Glass Co., Port Allegheny

The Olean Glass Co., Port Allegheny

Effie Kelly Stone Aggs. Co., Port Allegheny

Roberts, Winner & Co., Quakertown

Siding Furniture Co., Railroad

Anchor Rendering Works, Reading

Biehle's Carriage and Wagon Works, Reading

Auber S. Deysher, Reading

Leinbach & Co., Reading

Nolde & Hoist Co., Reading

Lesher-King Knitting Co., Ltd., Reamstown

Miller Bros., Red Lion

Red Lion Furniture Co., Red Lion

Noah C. Stabler, Red Lion

Oil City Asbestos Co., Red Lion

Jefferson Macaroni Co., Reynoldsdale

Landis Bros., Rhemus

Bingham Co., Memphis

Red Lion

Victor Box Mfg. Co., Ricklund Center

H. H. Harman, Rock Glen

Emmanuel G. Fry, Womelsdorf

Sheffield Glass Bottle Co., Sheffield

Rogersdorf Diamond Glass Co., Rogersdorf

Granville Stone Co., Rogersdorf

Keystone Meter Co., Rogersdorf

W. H. Rogersdorf & Sons, Rogersdorf

Rogersdorf Springs Bottle Co., Rogersdorf

Jno. F. Fitzimmons, Schuylkill

Meck & Keever, Schuylkill Haven

Noah Law Box Factory, Seven Valleys

Harper Bros., Shade Gap

The National Malleable Castings Co., Sharon

Nufor Cedar Co., Sharon

Sheffield Glass Bottle Co., Sheffield

Boher & Phillips, Shippensburg

Peerless Furniture Co., Shippensburg

Shrewsbury Furniture and Mfg. Co., Shrewsbury

American Slate Works, St. Johnstown

National School Slate Co., St. Johnstown

Charles Zelner, St. Johnstown

Empire Glass Co., Smethport

Smethport Glass Co., Smethport

Bellechere Steel Co., Bethlehem

The Graves & Eighmy Co., Spring Grove

Keystone Stone Foundry, Spring City

Elk Pilot Bottle Co., Shingtown

Bohler & Phillips, Shippensburg

Iverton Tobacco Co., Stewartstown

Sunbury Table Works, Sunbury

Fidelity Glass Co., Tarentum

Pittsburgh Plate Glass Co., Tarentum

Messimer Mfg. Co., Tamaqua

Titusville Handle Co., Titusville

J. O. Fitch & Sons, Townsend

Frank A. Rockwell, Troy

Troy Engine and Machine Co., Troy

Hanson Furniture Co., Union City

Loomis Table and Furniture Co., Union City

The Novelty Wood Works Co., Union City

The Star Furniture Co., Union City

Keystone Bottle Mfg. Co., Uniontown

Verona Tool Works, Verona

Granville Haus, Womelsdorf

Griffiths Charcoal Iron Mills, Washington

Highland Glass Co., Washington

Washington Tin Plate Co., Washington

Emmert Mfg. Co., Waynesboro

Frick Co., Waynesboro

Landis Lumber Co., Waynesboro

Landis Tool Co., Waynesboro

Osterburg Tin Plate Co., Waynesboro

D. W. Franze, Waynesboro

Hoopes Bro. & Darlington, Inc., West Chester

W. B. Bertsold & Son Co., Wilkes-Barre

George B. Broom, Williamsport

A. H. Hollman & Co., Williamsport

National Furniture Co., Williamsport

J. R. C. Knapp, Williamsport

West Branch Box and Lbr. Co., Williamsport

Westinghouse Air Brake Co., Wilmerding

Arnold & Tschall, Williamsport

Williamson & Moyer, Womelsdorf

Nufor Cedar Co., Woodlawn

Cold Spring Brewing and Finishing Works, Yardley

H. E. Boring & Bro., York

Aiden Basing, York, R. D.

A. F. Paraghall Co., Ltd., York

179
Wallick & Gohn, York
West York Furniture Mfg. Co., York
York Carriage Mfg. Co., York
York Wagon Gear Co., York
Youngeville Mfg. Co., Youngsville

Geoffrey W. H. Shepl Mfg. Co., N. E. Cor. 6th St. and
Coal & Coke Co., Philadelphia
Shepl & Vandegrift, Inc., 814-822 N. Lawrence
Philadelphia
Keystone Box Co., 19 Miller, Pittsburgh
D. J. Rex & Co., Boyd and Locust Sts., Pitts-
burgh
P. C. Smith & Bros., Corry and Kilbrick Sts.,
Pittsburgh
Joseph Wasser, No. 1 Miller St., Pittsburgh
Wommer & Rock, Pottsville
W. R. Pickthorn, Reading
L. B. Miller, Red Hill
J. E. Detwiler, Red Lion
Miller Bros., Red Lion
M. H. West & Son, Richland
Victor Box Mfg. Co., Richland Center
W. A. Kaibach & Sons, Rosebonia
Emanuel G. Fry, Rothville
Samuel Hauser, Schaefferstown
Monroe D. Sellers, Sellersville
Noble Law Box Factory, Seven Valleys
H. S. Sondor, Souderton
Ertel Bros., Williamsport
Arnold & Tose, Wissahickon
Willanssen & Moyer, Womelsdorff
James R. Huthamaker, Wyoming
Aden Engel, York
H. W. Heffner & Son, York
A. Kaufman & Bros., York
E. Myers & Co., York
Wallick & Gohn, York

BRUSHES

Theo. A. Gerke, 205 Quarry St., Philadelphia
The Harvev & Watt Co., 1522 E. Venango St.,
Philadelphia
Nelms & Co., 467 Commerce St., Philadelphia
Thomas Ott & Co., 1234-1236 Washington Ave.,
Philadelphia
Leon Rozzen, 1963 N. Second St., Philadelphia
A. Steiert & Son, 1406 S. Front, Philadelphia

BUTCHERS' BLOCKS AND SKEWERS

P. B. Crider & Son, Bellefonte
Reading Wood Pulley Co., Reading

CAR CONSTRUCTION

Adamsburg Gas Coal Co., Adamsburg
Alden Coal Co., Alden Station
W. Harry Brown, Aliquippa
Bellfield Coal & Coke Co., Altoona
Dunbar Coal Mining Co., Altoona
Latrobe Coal Co., Altoona
Lilly Coal Co., Altoona
Penn. R. R. Car Shops, Altoona
East Penn. Lumber Co., Inc., Analomink
Fall Brook Coal Co., Antrim
West Penn. Coal Mining Co., Apollo
Nelder Coal Co., Argentine
Central R. M. Lumber of New Jersey, Wilkes-
Barre, Ashley Br. P. O.
Mrs. Louise Mensch, Auburn
Pittsburgh and Southwestern Coal Co., Avella
Charles M. Dodson & Co., Beaver Brook
Beaver Run Coal Co., Beaverdale
A. Davidson, Beaver Falls
Penn. R. R. Co., Bellwood
Geo. P. Bruhaker, Berlin
Connell Anthracite Mining Co., Berwick
Wachua-Taylor Anthracite Co., Berwick
American Car and Foundry Co., Berwick
Lehigh and New England R. B. Bethlehem
Kettle Creek Coal Mining Co., Bitumin
Bells Mill Co., Blairsville
Blairsville Coal Co., Blairsville
Conemaugh Coal Co., Blairsville
Graft Coal Co., Blairsville
Kiskiminetas Coal Co., Blairsville
Mahler Coal and Coke Co., Blairsville

Roaring Run Mining Co., Blairsville
American Car and Foundry Co., Bloomsburg
Blacksburg Car and Equip. Co., Bloomsburg
Herman & Hassett, Inc., Bloomsburg
Blossburg and Coal Run Coal Co., Blossburg
Jenkins Bros., Blossburg
Terril Coal Co., Blairsville, R. D.
Improved Traction Eng. Co., Boynton
McClure Coal Co., Bridgeville
Franklin Coal Mining Co., Brishnin
Brier Hill Coke Co., Brier Hill
Schuykill Lehigh Coal Co., Brockton
Toby Coal Mining Co., Brockwayville
Monocahela R. & R. Car Repair Shops, Brown-
sville
Union Connellsville Coke Co., Brownsville
Lake Shore Gas Coal Co., Buena Vista
Cascade Coal & Coke Co., Buffalo, N. Y.
Standard Steel Car Co., Butler
East Mountain Coal Co., Carbonsdale
Wm. M. Cole, Carnegie
P. & R. R. Repair Shops, Catawissa
H. K. Wick & Co., Catskill
Conemaugh Valley Coal R. Co., Chambersburg
Cheat Haven Coal Co. & Coke Co., Cheat Haven
Cherry Tree Iron Works, Cherry Tree
Hartman Coal & Coke Co., Cherry Tree
H. J. Stone Coal Co., Childs
Clearfield Bituminous Coal Corp., Clearfield
Clearfield Clay Working Co., Clearfield
Goshen Coal Co., Clearfield

D. F. Gulich, Clearfield, R. D.

BOXES AND CRATES, PACKING—Continued

H. W. Heffner & Son, York
A. Kaufman & Bros., York
Marion H. Long, York
The Martin Carriage Works, York

Henry H. Shepl Mfg. Co., N. E. Cor. 6th St. and
Coal & Coke Co., Philadelphia
Shepl & Vandegrift, Inc., 814-822 N. Lawrence
Philadelphia
Keystone Box Co., 19 Miller, Pittsburgh
D. J. Rex & Co., Boyd and Locust Sts., Pitts-
burgh
P. C. Smith & Bros., Corry and Kilbrick Sts.,
Pittsburgh
Joseph Wasser, No. 1 Miller St., Pittsburgh
Wommer & Rock, Pottsville
W. R. Pickthorn, Reading
L. B. Miller, Red Hill
J. E. Detwiler, Red Lion
Miller Bros., Red Lion
M. H. West & Son, Richland
Victor Box Mfg. Co., Richland Center
W. A. Kaibach & Sons, Rosebonia
Emanuel G. Fry, Rothville
Samuel Hauser, Schaefferstown
Monroe D. Sellers, Sellersville
Noble Law Box Factory, Seven Valleys
H. S. Sondor, Souderton
Ertel Bros., Williamsport
Arnold & Tose, Wissahickon
Willanssen & Moyer, Womelsdorff
James R. Huthamaker, Wyoming
Aden Engel, York
H. W. Heffner & Son, York
A. Kaufman & Bros., York
E. Myers & Co., York
Wallick & Gohn, York

H. Weitzen, Branim
Earle Brush Co., Columbus
C. A. Mahle & Son, Corry
August Flügel, Hecla
Holgate Bros. Co., Kane
H. A. Williams, Lake Como
Elder & Jenkins, 415 Vine St., Philadelphia
Thomas J. Fleming, 131 N. Tenth St., Phila-
adelphia

P. B. Crider & Son, Bellefonte
Reading Wood Pulley Co., Reading

Patterson Bros. Co., Wellsboro

Parsons Bros. Co., Wellsboro

W. H. Heffner & Son, York
A. Kaufman & Bros., York
E. Myers & Co., York
Wallick & Gohn, York

Wallick & Gohn, York
West York Furniture Mfg. Co., York
York Carriage Mfg. Co., York
York Wagon Gear Co., York
Youngeville Mfg. Co., Youngsville

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Elder & Jenkins, 415 Vine St., Philadelphia
Thomas J. Fleming, 131 N. Tenth St., Phila-
adelphia

Patterson Bros. Co., Wellsboro

W. H. Heffner & Son, York
A. Kaufman & Bros., York
E. Myers & Co., York
Wallick & Gohn, York
CAR CONSTRUCTION—Continued

Highland Coal Mining Co., Real Estate Trust Bidg., Philadelphia
Logan Coal Co., Redford Bidg., Philadelphia
Loyalhanna Coal & Coke Co., Land Title Bidg., Philadelphia
Lazelle Bros., Allegheny Barre Coal Co., 716 Reading Terminal, Philadelphia
Nasty Glo Coal Mining Co., 724 Land Title Bidg., Pittsburgh

Northern Central Railway, Philadelphia
Pennsylvania R. R., West Philadelphia, Philadelphia

Philadelphia Rapid Transit Co., Land Title Bidg., Philadelphia
Philco & Westchester Railway Co., Philadelphia

W. H. Piper & Co., Real Estate Trust Bidg., Philadelphia

Plymouth Coal Mining Co., Real Estate Trust Bidg., Philadelphia

Shoemaker Coal Mining Co., 1507 Real Estate Trust Bidg., Pittsburgh

South Fork Coal Mining Co., Bullitt Bidg., 423 Chestnut St., Philadelphia
Sterling Coal Co., 421 Chestnut St., Philadelphia
Urey Ridge Coal Co., 1069 Franklin Bank Bidg., Philadelphia

Ashman Coal Co., Philadelphia
Atkinson-Krebs & Co., Philadelphia
Madeira Hill Coal Mining Co., Phillipsburg
R. H. Mull, Phillipsburg

Victoria Coal Co., Phillipsburg
Wicks Bros. Coal Co., Philadelphia

Pennsylvania Railroad, Pittsburg

Altounian & Son, General R. R. Co., Second Ave. & Ross St., Pittsburgh

Baltimore & Ohio R. R. Co., Glenwood Shops, Pittsburgh

Bessemer Coal & Coke Co., 2212 Oliver Bidg., Pittsburgh

Bessemer Coke Co., Oliver Bidg., Pittsburgh
Blaine Coal Co., Fulton Bidg., Pittsburgh
Boggs & Coke Co., Pittsburgh

Buffalo, Rochester & Pittsburgh Ry. Co., Pittsburgh

Cumberland Coal Co., 1315 Paix Bidg., Pittsburgh

Diamond Coal & Coke Co., 1109 House Bidg., Pittsburgh

The Parente Coal Co., Fourth Ave. & Wood St., Pittsburgh

Jenner-Queenstown Coal Co., First Natl Bank Bidg., Pittsburgh
Middletown Car Co., Frick Bidg., Pittsburgh
Montour R. R., Pittsburgh
Montourbela Coal Co., Coal & Coke Co., Smithfield St., Pittsburgh

Mountaineer Coal & Coke Co., 2294 Oliver Bidg., Pittsburgh

Nomi Coal Co., First Natl Bank Bidg., Pittsburgh

Oliver & Snyder Steel Co., South Tenth & Muriel Sts., Pittsburgh
Penn. & Lake Erie R. R., Pittsburgh
Pennsylvania Railroad, 2nd and Carson Sts., Pittsburgh

Phillips Mine & Mill Supply Co., 227 Jane St., S. S., Pittsburgh

Pittsburgh-Baltimore Coal Co., First National Bank Bidg., Pittsburgh

Buffalo-Pittsburgh, Fourth floor Frick Bidg., Pittsburgh

Pittsburgh Coal Co., Smithfield St., Pittsburgh

Pittsburgh-Westmoreland Coal Co., Fulton Bidg., Pittsburgh

J. H. Sanford Coal Co., 1215 Park Bidg., Pittsburgh

Pittsburgh-Connellsville Coal Co., 49th St. & A. V. Ry., Pittsburgh

Pittston Coal Co., Fulton Bidg., Pittsburgh

Presbyterian Steel Car Co., Pittsburgh

J. H. Sanford Coal Co., 1215 Park Bidg., Pittsburgh

Sibert-Connellsville Coal Co., First Natl Bank Bidg., Pittsburgh

Somerset-Beaver Coal Co., First Natl Bank Bidg., Pittsburgh

Summit Coal Co., First Natl Bank Bidg., Pittsburgh

The Ven-Go Coal Co., Third Ave. & Ross St., Pittsburgh


James Walton, Crafton (Br. P. O.), Pittsburgh

McCauley Coal Co., Pittston

Pittsburgh Coal Co., Pittsburgh

Pittsburgh Coal Co., Portage, R. D.

Pittsburgh Coal Co., Fallowfield, Pittsburgh

Penna. R. R., Pottsville

The Phila. & Reading Coal & Iron Co., Pottsville

Anita Coal Mining Co., Punxsutawney

Bowersville Coal Co., Punxsutawney

McLevy & Green Pittsburgh

Punxsutawney Coal Mining Co., Punxsutawney

Punxsutawney Edy. & Machine Co., Punxsutawney

Colonial Coal Co., Puritan

Dodge, Prince & Sons, Puritan

Bulah Shaft Coal Co., Ramey

Girard Mammoth Coal Co., Raven Run

Philadelphia & Reading Ry. Co., Reading

Jermy & Co., Rendhaw

Hugh McGhugh, Rennie

Lawrence, R. R. Co., Renovo

Russell Car & Iron Plow Co., Ridgeway

Brandenburg Coal Mining Co., Rockwood

Irons Coal & Coke Co., Rose Bud

Butcher Creek Coal Co., Saint Clair

Mount Hope Coal Co., Saint Clair

South Coal Co., Saint Clair

Shawmut Mining Co., Saint Marys

Cochran Coal Co., Salina

Humber Coal Mining Co., Saint John

K. E. Schiltzberger & Co., Saint John

Lehigh Valley Railroad Co., Sayre

Lincoln Coal & Coke Co., Scottsdale

Wissahickon Coal Co., Scranton

Cornell & Brown Coal Co., Dunmore, Scranton

Delaware, Lackawanna & Western R. R. Co., Scranton

Dolph Coal Co., Ltd., Scranton

Hillside Coal & Iron Co., Dunmore, Scranton

Locke & Wyoming Valley R. R. Co., Scranton

Nay Aug Coal Co., Scranton

Pennsylvania Coal & Coke Co., Dunmore, Scranton

People's Coal Co., Scranton

Scranton Coal Co., Scranton

Oxford Coal Co., Scranton

H. H. Smith Co., Shaft

Somerset Coal & Coke Co., Shamokin

Shipman Coal Co., Shamokin

Purdue Coal Co., Sharon

Western Filer Coal Co., Sharon

Shawmut Vitriolizing Paving Brick Works, Shamokin

Thomas Valley Railroad Co., Sheffield

Thomas Collery Co., Shenandoah

James M. McIntyre, 50 Mile Run

Montoursville Coal Co., Six Mile Run

Raxter Ridge Coal Co., Smithfield

Rogers & Coal Co., Smithfield

Smithfield Coal & Coke Co., Smithfield

Clark Bros., Coal Mining Co., Scranton

Leland Coal Mining Co., Scranton

Smokevax & C., Western R. R. Co., Scranton

Smithfield Coal Co., Scranton

Somerset County, Somerset

Somma Coal Co., Scranton

H. C. Stenman, South Fork

O. M. Stenman, South Fork

Delinger Bros., Southington

Woodland Coal & Coke Co., Spangler

Mercey & Iron Co., Starboro

R. K. Underwood, Strattiville

New York, Susquehanna & Western R. R. Co.,

Strattiville

Moses Neighbors, Summitville

East Deer Coal Co., Tarentum

Pennsylvania Coal Co., Throop

Sussman & New York R. R., Towanda

Upper Lelish Coal Co., Upper Lelish

Browning Coal Co., Uniontown

Ironville Coal Co., Uniontown

Hustead-Connellsville Coal & Coke Co., Uniontown

Mount Hope Coal Co., Uniontown

Newcomer Coal Co., Uniontown

J. Paschall, Uniontown

Prospect C. & C. Co., Uniontown

Shannon C. & C. Co., Uniontown

Sunshine Coal & Coke Co., Uniontown

Towers Connellsville Coal Co., Uniontown

182
CAR CONSTRUCTION—Continued

Montoursville

Whyl Coke Co., Uniontown
Pennsylvania R. R. Vernon
Union Collery Co., Vintondale
Oakes Bros. Coal Co., Volant, R. D.
Genuine Connellsburg Coke Co., Walkersburg
Beaver Coal & Coke Co., Wampum
Waynesburg & Washington Railroad Co., Waynesburg

Lackawanna Coal & Coke Co., Wehrum
A. J. Lundquist & Co., Weedsboro, R. D.
Midvalley Coal Co., Wilburton
Standard Moshannon Coal Co., Williamsport
Central R. R. Co. of New Jersey, Ashley, Lehigh
Valley Coal Co. & Coxe Bros. & Co., Inc., Wilkes-Barre
Moravia Run Coal Mining Co., Wilkes-Barre.
W. H. Shepherd & Son, Wilkes-Barre
Susquehanna Coal Co., Wilkes-Barre
Vulcan Iron Works, Wilkes-Barre
The Shenango Furnace Co., Wilpen

CASKETS AND COFFINS

Bangor Casket Mfg. Co., Bangor
Boyertown Burial Casket Co., Boyertown
Erie Burial Case Co., Erie
F. H. Campbell, Espyville
The Freedom Casket Co., Freedom
Harrisburg Burial Case Co., Harrisburg
Keystone Mfg. Co., Coraopolis
J. S. Claypool Lbr. Co., Kittanning
J. D. Bowers, New Holland
J. C. Hunthiner, Sunbury, J. C. Hunthiner, Sunbury
Penn. Burial Case Co., Reynoldsdale
Riegelfield Mfg. Co., Riegelfield
C. L. Wilnot, Rome

CHAIRS AND CHAIR STOCK

Boehm & Spiegel Co., Allentown
Johnston & Swartz, Allentown
The Yeager Furniture Co., Allentown
A. C. Kelly, Center Morland
Clearfield Woodenware Co., Inc., Clearfield
Coraopolis Mfg. Co., Coraopolis
Corry Chair Co., Corry
U. S. Chair Co., Corry
Keystone Handle Co., Corydon
J. D. Westcott & Son, Enkaevor
B. T. Beers, Fallentimer
Kutz Furniture Co., Fullerton
Greenburg Swing Co., Greensburg
American Chair Manufacturing Co., Hallstead
Wm. Kemper, Hampton
Jesse Wolford, Hunterstown
Indiana, Bent Rider Ladder Co., Indiana
W. DeFrehm & Sons, Johnstown
Emporium Lumber Co., Keating Summit
Shenango Creek Lumber Co., Kolletsville
Penn. Swing & Ladder Co., Lancaster
Lewisburg Chair Co., Lewisburg
Lehental Bros., Lititz
Glen Mayer Novelty Works, Mawrigen
Willson-Bennett-Porter Co., Montoursville
James Barker, Inc., Sixth & Cayuga, Philadelphia
Bloch Go-Cart Co., 1126-48 N. American St., Philadelphia

Then Pen Argyl Clock Case Co., Pen Argyl
American Cuckoo Clock Co., 1665 Ruffner St., Philadelphia

DAIRYMEN'S, POULTEERS' AND APRIARISTS' SUPPLIES

Charles Incubator Co., Columbus
F. E. Westby, Corry
Prairie State Incubator Co., Homer City
W. S. Wilcox, Tannersville, Jamesstown P. O.
Dairymen's Supply Co., Lansdowne

ELEVATORS

Sproat, Waldron & Co., Muny
The Albco-Clea Elevator Co., Seventh St. & Philadelphia
The Albco-Clea Elevator Co., Seventh St. & Philadelphia
Atlas Elevator Co., 611 Cherry St., Philadelphia
Eastern Elevator Co., 228 Callowhill, Philadelphia

These companies have colliers in Pennsylvania.

Sprout-Waldron & Co., Muny
The Albco-Clea Elevator Co., Seventh St. & Philadelphia
Walter E. Goodman, 222 Callowhill, Philadelphia
Indepedent Elevator Co., 719 Cherry, Philadelphia
Keystone Elevator Co., 23rd & Sansom Sts., Philadelphia

Berwind-White Coal Mining Co., Windber
Rummel Coal Mining Co., Windber
Carroll Coal Co., New Bloomfield
Cascadel Coal & Coke Co. (Miners at Tyler and Sykesville, Penn.), Buffalo, N. Y.
Jefferson & Clearedfield Coal & Iron Co., Rochester, N. Y.
Rochester & Pittsburgh Coal & Iron Co., Rochester, N. Y.
Allegany Coal Co. (Miners at Cheswick, Penn.), Cleveland, Ohio
Warren Coal Co., Cleveland, Ohio
W & P. Co., Cleveland, Ohio
Island Run Coal Co., East Liverpool
Atlas Cokc Co. (Works at Helen, Penn.), Lee, Ohio
McKeefray Coal Co., Lebanon, Ohio
LaBelle Coal Co., Steubenville, Ohio
The Witch Hazel Coal Co., Youngstown, Ohio

A. & J. Janton, 100-30 N. Eleventh St., Philadelphia
The Paxson & Comfort Co., 529 Arch St., Philadelphia
National Casket Co., 323 Charters St., North Philadelphia
C. G. Sellers, Saint Thomas
United States Casket Co., Scottsdale
John Benrose, Scranton
Simpson Lumber Co., Sunbury
Sunderland Lumber Co., Sunbury
Biscoff Estate, Tamaqua
Charles Fritz, Weisenberg
L. B. Lacev, West Auburn

Frederick Clok Co., Waynesboro

Bodenstein & Kneermer, Inc., Lawrence St. & Girard Ave., Philadelphia
James W. Cooper, 120-26 Washington Ave., Philadelphia
John G. Wood Turning Co., 222 Vine St., Philadelphia
J. Hetherington, 256 Quarry St., Philadelphia
Sikes Furniture Co., 221 Sad & Passyunk, Philadelphia
I. H. Wider & Son, 222 & 225 N. Sixth St., Philadelphia
A. G. Peto, 5555 Baun St., Pittsburgh
Pittsburgh Hardware Working Co., 31 Water St., Pittsburgh
M. M. Wheister, Schenectady
Mayes Novelty Factory, Sonestown
The C. Luttrell Becker Co., Ltd., Titusville
Titusville Elastic Chair Co., Titusville
Titusville Handle Co., Titusville
The Shamong Chair Co., Union City
Standard Chair Co., Union City
The Union City Chair Co., Union City
Variety Turning & Furr, Mfg. Co., Union City
Samuel Peterson, Warren
F. B. Sherman, Williamsburg
J. K. Risher Furniture Co., Waylandsport
Simmons Wood Working Co., Williamsport
D. N. Byers, Woodbury

Energy Elevator Co., 2172 New St., Philadelphia
Roller Tray Elevator Co., Northampton
Phoenixville Mfg. Co., Phoenixville
The Elevator Co., West Chester
H. W. White, Whitesville
J. K. Hornbeck, Equinunk
Hotchkiss & Son, Lawrenceville
Gormley Brothers, Haddonfield

Anton Looper, Ashland
Adam Wahlner, Ashland
Penn. R. R. Car Shops, Altoona
Kurtz Bros., Bethlehem
A. R. Harbaugh, Bloomsburg
Federal Equipment Co., Carlisle
Walbert Lumber Co., Charleroi
St. Francis Industrial School, Eddington
Exhibition Show Case Co., Erie
Johannesen Mfg. Co., Erie
M. Schultz, Galitzin
Glen Mfg. Co., Glen Rock
L. B. Waltmer, Hancock
Henry Shaffer Lumber Co., Kittanning
The Wohlsen Planing Mill Co., Lancaster
H. E. Walters, Middleburg
Middletown Furniture Co., Middletown
Montgomery Table Works, Montgomery
Stokes Mfg. Co., Montgomery
Basc & Co., 492 Cherry, Philadelphia
B. Bernheim & Sons, 1401 N. Third St., Philadelphia
Meyer Cossay, 624 Filbert St., Philadelphia
John Ernst & Co., 2208 Germantown Ave., Philadelphia
W. J. Fisher & Co., 1216-18 N. Fifth St., Philadelphia
Cluett & Co. Geisler, 62 N. Fourth St., Philadelphia
Interior Milling Co., 2521 Poplar St., Philadelphia
Iron Co., 1401 Germantown Ave., Philadelphia
Karcher & Rehn Co., Twelfth & Hamilton Sts., Philadelphia
Kasisky & Bloom, 231-33 N. Lawrence St., Philadelphia
Stephen E. Kretan, 12 S. 24th St., Philadelphia
Keystone Display Rack Co., 1352 Parrish, Philadelphia
J. Kirchhof & Co., 418 N. Twelfth St., Philadelphia
Francis D. Kramer, 1601 Spring Garden St., Philadelphia
George E. Lucas, 3013 Montgomery Ave., Philadelphia
John J. McCluskey, 149 N. Fourth St., Philadelphia
Mallock & Coddington, 611 Cherry St., Philadelphia
Miller & England Co., 1124-25 Washington Ave., Philadelphia
Northern Central Railway (Address, Mt. Vernon Car Shop, Baltimore, Md.), Philadelphia
Pennsylvania Store Fixture Co., 1304 N. Second St., Philadelphia
Julius A. Rath's Sons, 304 Master St., Philadelphia
Ridgeway Refrig. Co., 3513 N. Lawrence St., Philadelphia
William Russell Woodworking Co., 3055-29 Chestnut St., Philadelphia

McKay Gilmore Furniture Co., Grove City, Pa.
Penn & Slocum & Frey, 1218 Mascher, Philadelphia
Glen Mawr Novelty Works, Mawr Street
Eclipse Pulley Co., Meyersdale
Penn & Selkirk Co., 471 Kansas St., Pittsburgh
R. M. Bowser & Son, Renfrew
The Special Novelty Works, Dunecannon
J. G. McDougal, West View
Keystone Farm Machine Co., York

EXCELSIOR
Handle & Excelsior Co., Picture Rocks
Prompton Excelsior Co., Prompton
M. Elmore, White Mills

FIT Fixtures
Harry R. Rust, 724-26 Ludow St., Philadelphia
Sanitary Specialties Co., 1824 E. Clearfield St., Philadelphia
C. J. & A. Schad, 519 Bainbridge St., Philadelphia
Segall & Son, 729 Jefferson St., Philadelphia
Louis Sher, 212 S. Eighth St., Philadelphia
Silicon Steel & Fluorine, 1218 Mascher, Philadelphia
John E. Sjostrum Co., Inc., 1719 N. Tenth St., Philadelphia
Snee & Bros. Co., Church & Tacoma Sts., Philadelphia
H. Dan'l Sorg, S. W. cor. Front & Montgomery Ave., Philadelphia
Robert Tario & Son, 413-17 S. Fifth St., Philadelphia
H. Tiedemann, N. W. cor. Nineteenth St. & Washington Ave., Philadelphia
W. V. Mfg. Co. (John B. Vernon, Partner), 1016 North St., Philadelphia
Harry Walter, 1711 N. 21st St., Philadelphia
Weiner, Weis & Co., 246 Cherry St., Philadelphia
A. Witt & Sons, 721 N. Front St., Philadelphia
Frederick V. Yeager, 9-13 S. 35th St., Philadelphia
P. R. R. Co., Pitcairn
Barnes Safe & Lock Co., 227 Third Ave., Pittsburgh
S. Delp's Sons, Fourth & Liberty, Pittsburgh
Berger & Eckler Co., 1127 Pennsylvania Ave., Pittsburgh
Kates & Co., Grant Block, Pittsburgh
Kane & Sons Mfg. Co., 304-24 Warrington Ave., Pittsburgh
Geo. B. Monks Co., 8-16 Ketchum, Pittsburgh
National Electric Shoe Shining Mfg. Co., 422 First St., Pittsburgh
Pittsburgh Hardware Working Co., 53-54 Water St., Pittsburgh
P. L. E. R. R., Pittsburgh
Union R. R. Co., Fort Perry
Josiah Frederick, Pottstown
Penna. R. R. Co., Pottsville
R. M. Bowser & Son, Renfrew
The Woodwork Supply Co., Reynoldsdale
John Benore, Scranton
Brown Bros., Scranton
Deckjar Mfg. Co., Scranton
Valverdo Mfg. Co., Scranton
J. E. Newbold & Co., Sellersville
The National Malleable Castings Co., Sharon
Bethlehem Steel Co., South Bethlehem
Bishop Estate, Tamaqua
Penna. R. R., Verona
Moss Furniture Co., Warren
Wettstine & Co., Warren
E. T. Long & Co., Wilkes-Barre
E. B. Sherman, Williamsburg
Dittmeyer Furniture Co., Williamsport
Geo. W. Gilbert, York
George A. Swartz, York
Youngsville Mfg. Co., Youngsville
FURNITURE—Continued

Elmer Yingling, Wayneboro
Comenico Furniture Co., Warren
Geo. L. Folkman, Warren
Mensa Furniture Co., Warren
Phoenix Furniture Co., Warren
Warren Table Works, Warren
Watsonville Table & Furniture Co., Watsonville
Pareka Mfg. Co., Weissport
E. B. Schermer, Williamsburg
A. H. Helman & Co., Williamsport
Keystone Furniture Co., Williamsport
National Furniture Co., Williamsport
J. K. Rishel Furniture Co., Williamsport
Williamsport Furniture Co., Williamsport
H. N. Byers, Woodbury
H. E. Edering & Bro., York
Home Furniture, York
Keystone Farm Machine Co., York
Pa. Furniture Co., York
West York Furniture Mfg. Co., York
Forest Furniture Mfg. Co., Youngsville
Youngsville Mfg. Co., Youngsville

GATES AND FENCING

Chester Pence Co., Chester Heights
Rutter Bros., Turtle Creek, East Pittsburgh
Evans, Elwyn
Henry Shaffer Lumber Co., Kittanning
Northern Central Railway (Address, Mt. Vernon
Car Shop, Baltimore, Md.), Philadelphia

Penna. R. R. Car Shops, Altoona
J. L. McLaughlin & Sons, Bedford
Hertzler & Zeck Co., Belleville
Cumberland Valley R. R. Co., Chambersburg
M. B. Landle & Co., Cooperstown
Cedrus Handle Co., Cedrus
Keystone Handle Co., Corydon
E. H. Lethers, Curtin
Ringer & Co., Delmont
C. W. Hillyp & Co., Eldred
J. H. Young Lumber Co., Eldment
J. D. Westcott & Son, Endeavor
Theo. J. Ely Mfg. Co., Erie
Erie City Mfg. Co., Erie
Washburn Mfg. Co., Erie
F. H. Campbell, Espyville
Penna. Saw Co., Frackville
Marsteller Bros. Lumber Co., Fredonia
Girard Wrench Mfg. Co., Girard
M. D. Hoke, Hokes Mills
Howard Handle & Spoke Co., Howard
The L. O. Hasinger Co., Indiana
Robinson & Styrke, Keating Summit
Sheldon Handle Co., Kinzua
Lembertler Bros., Lockport
American Fork and Hoe Co., North Girard
Penn Mfg. Co., North Girard
Hammond & Son, Ogmont
J. G. Meyer & Sons Co., Perkasie

INSTRUMENTS, MUSICAL

A. B. Feltenjager Organ Co., Erie
A. Gottfriid & Co., Erie
Kellmer Piano Co., Hazleton
Miller Organ & Piano Co., Lebanon
Bates & Calley, 706-13 Mercy St., Philadelphia
Cunningham Piano Co., 4948 Parkside Ave.,

C. S. Haskell, 1520-22 Kater St., Philadelphia

INSTRUMENTS, PROFESIONAL AND SCIENTIFIC

Penna. R. R. Co. (Foundries), Altoona
Lojan Iron & Steel Co., Burnham
Theo. Alteneder & Sons, 945 Ridge Ave., Philadelphia
Charles A. Anderson, 1829 N. Tenth St., Philadelphia
Nathan Cohen, 1125 N. Oriliana, Philadelphia
John Grass Wood Turning Co., 222 Vine St.,
Cleveland
T. H. Grigg, Lancaster Ave. & Baring St., Philadelphia

Joseph B. Levy, 1429 21st St., Philadelphia
Lippincott Pencil Co., 220 N. 23rd St., Philadelphia
Thos. Mills & Bro., Inc., 1301 N. Eighth St.,
Philadelphia
Sneddon Bros. Co., Church & Tacony Sts., Franklin, Philadelphia
Martin H. Walraith, Broad & Cambria Sts., Philadelphia
Bethlehem Steel Co., South Bethlehem
Verona Tool Works, Verona

INSULATOR PINS AND BRACKETS

The I. C. Hasinger Co., Indiana
Robins Pin Co., Newville

S. J. Bailey, Nicholas
J. W. Endesley, Somersfield

LADDERS

Appolo Step Ladder Co., Appolo
Cemopolis Mfg. Co. & Novelty Co., Erie
American Mfg. & Novelty Co., Erie
Indiana Bent Rung Ladder Co., Indiana
Penn. Swing and Ladder Co., Lancaster
Pencoyd Iron Works, Pencoyd

Nathan Cohen 1125 N. Oriliana, Philadelphia
John P. Little Co., Picture Rocks
Bethlehem Steel Co., South Bethlehem
Export Coal Co., Export
Clifton Falls Coal Co., Forest City
Eagle Coal Co., Fredonia
Kerr Coal Co.,Fortunately
H. D. Brady, Gallitzen
The Taylor & McCoy Coal & Coke Co., Gallitzen
Enterprise Coal Co., Garrett
W. R. McFerr Coal Co., Girardsville
Cornell Coal Co., Glassmere
Granton Coke Co., Graceton
Apollo Coal Co., Greensburg
Atlantic Crushed Coke Co., Greensburg
Keystone Coal & Coke Co., Greensburg
Rich Hill Coal Co., Hastings
J. S. Weitz & Co., Hazelwood
Hardwood Coal Co., Hazleton
Hule Mountain Coal Co., Hazleton
A. H. Farnace & Co., Hazleton
Estate of A. S. Van Wickle, Hazleton
Penn-Mary Coal Co., Hollidaysburg
Penna. Smokeless Coal Co., Hollisople
W. S. B. Hays, Homestead
Duck Run Coal Co., Huntingdon
John Landon, Huntington
The L. C. Hasinger Co., Indiana
Broad Top Coal & Mineral Co., Jacob
G. B. Markee Co., Jeddio
Humbert Coal Co., Jessup
Cumbria Steel Co., Johnstown
Suppes Coal Co., Johnstown
Great Lakes Coal Co., Kaysport
East Boston Coal Co., Kingston
Alldoffey River Mining Co., Kittanning
Stewart Coal Co., Knox, S.D.
The Lohigh & Haven Co., Lansford
Latrobe-Connelsville Coal & Coke Co., Latrobe
Unity-Connelsville Coke Co., Latrobe
Wilming-Coke Co., Monessen
Armstrong County Coal Co., Leechburg
Jan. Harris & Sons, Lilly
Lloyd Coal Mining Co., Lloyd
Logansport Coal Co., Logansport
Harlan & East Brady C. C., Logansport
Northern Anthracite Coal Co., Lope
Puritan Coke Co., McClellandtown
Bowman Bros. & McKeon
Moosic Mountain Coal Co., Marashwood
Spring Hill Coal Co., Mayfield
T. H. Wachow, Meadville
Atlantic Coal Co., Meyersdale
Phillips Bros., Middleport
Buck Run Coal Co., Minersville
Darkwater Coal Co., Minersville
Pine Hill Coal Co., Minersville
West End Coal Co., Mecanauqua
Dodson Coal Co., Morgantown
The Leesburg Coal & Coke Co., New Castle
Thompson Connelsville Coke Co., New Salem, R. D.
Olyphant Coal Co., Olyphant, R. D.
The Hedstrom Coal Mining Co., Parkers Landing
Mt. Jessup Coal Co., Peckville
Penfield Coal & Coke Co., Peckville
Colonial Collieries Co., Philadelphia
Forge Coal Mining Co., 1000 Franklin Bank
Bldg., Philadelphia
Highland Coal Mining Co., Real Estate Trust Bldg., Philadelphia
Leyheil & Willenauer Coal Co., 716 Reading Terminal, Philadelphia
Shoemaker Coal Mining Co., 1507 Real Estate Trust Building
South Fork Coal Mining Co., Bullitt Bldg., 421 Chestnut St., Philadelphia
Bensommer-Coke & Oliver Bldg., Pittsburgh
Blaine Coal Co., Fulton Bldg., Pittsburgh
Carnegie Coal Co., 335 Paix Bldg., Pittsburgh
H. C. Erickson Coal Co., Pittsburgh
John M. Greer & Co., 210 Park Bldg., Pittsburgh
Horiteller Connelsville Coke Co., Pittsburgh
Mountaineer Consolidated Coal & Coke Co., Smithfield St., Pittsburgh
Mountain Smokeless Coal Co., 2594 Oliver Bldg., Pittsburgh

Pittsburgh Coal Co., Smithfield St., Pittsburgh
Pittsburgh-Westmoreland Coal Co., Fulton Bldg., Pittsburgh
Samboni, Horrell, Wilkinsburg, etc., Pitts
Sons.
Somerset Smokeless Coal Co., First National Bank Bldg., Pittsburgh
United Connelsville Coke Co., Oliver Bldg., Pittsburgh
The Westa Coal Co., Third Ave. and Race St., Pittsburgh
McMorrow Coal Co., Pittston
Yost Mining Co., Pittston
Roaring Run Mining Co., Plainsville
Parrish Coal Co., Scranton
The Penker Coal Co., Portage, R. D.
Philadelphia & Reading Coal & Iron Co., Pottsville
Anita Coal Mining Co., Punnatsawanny
Bowersville Coal Co., Punnatsawanny
Cortice Coal Co., Ranney
John McLeavy & Co., Punnatsawanny
Geo. Pearce & Sons, Portunity
Buhl Coal Co., Ranny
Buhl Shaft Coal Co., Ramey
Girardsville Coal Co., Rainerven
Jermyn & Co., Rendolph
Irvona Coal & Coke Co., Rosebud
Butter Mine & Coke Co., St. Clair
Mount Hope, Coal Co., St. Clair
The St. Clair Coal Co., St. Clair
Coal Co., Steel Valley
Bowman Coal Mining Co., Saltsburg
M. S. Kemmerer & Co., Sandy Run
Lincoln Coal & Coke Co., Scardale
Carney & Brown Coal Co., Dunmore, Scranton
The Delaware, Lackawanna & Western R. R.
Scranton
Delaware, & Coal & Iron Co., Scranton
Pennsylvania Coal Co., Dunmore, Scranton
Peoples Coal Co., Scranton
Scranton Coal Co., Scranton
Oxford Coal Co., Shaft
H. H. Smith & Co., Shaft
Greenough Red Ash Coal Co., Shamokin
Shuman Coal Co., Shamokin
Thomas Collier Co., Shamokin
J. R. Anderson & Son, Shickshinny
Baxter Ridge Coke Co., Smithfield
Ireland Coal Mining Co., Co., Somerset
Colonial Collieries Co., Somerset
H. C. Stineman, South Fork
H. M. Stineman & Co., Tarentum
H. A. Underwood, Strattenville
East Deer Coal Co., Tarentum
D. L. H. McFay, Tarentum
Pence Pancoast Coal Co., Throop
Brownsville Coal Co., Uniontown
Hope Coke Co., Uniontown
Hustead & Seney Coal & Coke Co., Uniontown
Olive Coal Co., Uniontown
W. J. Marshall, Uniontown
Prospect Coal & Coke Co., Uniontown
South Fayette Coke Co., Uniontown
Waltersburg Coke Co., Uniontown
Whyde Coke Co., Uniontown
Huntley Colliery Co., Vintendale
Georgian Connelsville Coke Co., Waltersburg
Lackawanna Coal & Coke Co., Wehrum
A. J. Langlois & Co., Wethersfield R. D.
R. W. White & Sons
Midvalley Coal Co., Wilburton
Cove Bros. & Co., Wilkes-Barre
Leibig Coal Co., Wilkes-Barre
Slussenhana Coal Co., Wilkes-Barre
Sampson, Horrell, Wilkinsburg
P. O.
Bowling-White Coal Mining Co., Windber
W. H. Witten, Windber
*Jefferson & Clearfield Coal & Iron Co., Rochester, N. Y.
*Reliance Coal & Pittsburgh Coal & Iron Co., Roch-ester, N. Y.
*Warner-Leonard Coal Co., Cleveland, Ohio
*Horne Coal Co., Works at Helen, Pa., Lebanon, Ohio

*These companies have collieries in Pennsylvania.
International Motor Co., Allentown
Penn. R. R. Co. (Foundries), Altoona
Penn. R. R. Co. (Abrasives, Shops), Altoona
The Autocar Co., Ardmore
S. Florv Mfg. Co., Bangor
Keyes-Driller Co., Butler Falls
Herter & Zook Co., Bellefonte
Gruber Wagon Works, Berne-
nington
Bingham Foundry 
& Machine Shops, Braddock
Herman & Hassett, Inc., Bloom-
burg
Improved Traction Engine Co., Boy-
town
W. H. Penn. Steel Co., Bridge-
rick
RoF-enfranz American Union
Hyde McIyahan-Stone
The Pittsburgh Wm. American
General Pennsylvania
Downingtown
The Carbonburg California Foundry & Machine Co., California
American Welding Co., Carbondale
The Carbonburg Chambersburg Engineering Co., Chambersburg
The Wolf Co., Chambersburg
Chester Steel Co., Cherry Tree
American Steel Foundries, Chester
Federal Steel Foundry Co., Chester
Petterson Steel Casting & Mfgr. Co., Chester
Clearfield Fire Brick Co., Clearfield
Clearfield Machine Foundries
Harisbon Walker Ref., Clearfield
Luckens Iron & Steel Co., Coatesville
Fryer Heat Co., Co., Coatesville
The Kelsey Stove Co., Columbus
Corapollis Mfg. Co., Corapollis
Philadelphia Iron Works Co., Eddystone
The Eddystone Mfg. Co., Eddystone
A. Buch's Sons Co., Elizabethtown
L. L. Fink, Emporium
General Electric Co., Erie
National Foundry Co., Erie
Frank H. Glasson, Etna
Fleetwood Metal Body Co., Fleetwood
American Steel Foundries, Franklin
Wm. Shimer, Son & Co., Greens-
borough
Buffalo & Susquehanna R. R., Galeton
Pittsburgh Steel Foundry, Glassport
The Kiley & Jones Co., Greens-
borough
The W. O. Hickok Mfg. Co., Harrisville
Wilmut Engineering Co., Hazleton
McKeanan Stone Mfg. Co., Hollidaysburg
Hyde Park Foundry & Machine Co., Hyde Park
Pa. Rubber Co., Jeannette
E. & J. Trumpe Co., Johnstown
Cambria Steel Co., Johnstown
The Lorain Steel Co., Johnstown
American Road Machine Co., Kennett Square
Orenstein Arthur Koppel Co., Koppel
Crucible Steel Casting Co., Landsdowne
Samuel Co., of American Steel Co.
Rosenflanz Machine Co., McKeesport
Johnetta Fdy. & Mach., Co., Mariana
Robinson Mfg. Co., Muny
Sprout, Waldron & Co., Muny
Union Spring & Mfg. Co., New Kingston
The Allan Wood, Iron & Steel Co., Norristown
Norris Pattern and Machine Co., Norristown
National Transit Co. Shops, Oil City
Oil Well Supply Co., Oil City
Osceola Silica & Fire Brick Co., Osceola
S. B. Spring, Oil City
New Jersey Zinc Co., Palermo
American Bridge Co. and Penoyrd Iron Works,
Geo. R. Allen, 15th & Buttonwood, Philadelphia
American Pattern Works, 3330 Market St., Phila-
idelphia
Edwin A. Anderson, 203 Quarry St., Philadelphia
The Baldwin Locomotive Works, 500 N. Broad
Street, Philadelphia
James Barker, Inc., Sixth & Caruza, Phila-
delphia
Charles P. Biggin Co., 1329 Harlan St., Phila-
delphia
E. Bromiley & Son, Orthodox & Gurney, Phila-
delphia
Edw. L. Caley, 946 Ridge Ave., Philadelphia
Clarks Iron Foundry, 53rd & Pine. Road, Phila-
delphia
Geo. F. Cooper, 139 Reed St., Philadelphia
Oliver L. Dill, 406 N. Tenth St., Philadelphia
The Eyunon Evans Mfg. Co., 15th & Clearfield,
Philadelphia
Fairmount Patterns Works, 1922 Brandwine St., Philadelphia
Richard James Co., Buttonwood, Philadelphia
R. G. Fleschmann, 407 Cherry St., Philadelphia
Girard Iron Works, 50 & Master Sts., Phila-
delphia
The John Grass Wood Turning Co., 221 Vine St., Philadelphia
George G. Guertner, 210 Cherry St., Philadelphia
Hale & Kilburn Co., 15th & Lehaghi Ave., Philadelphia
William L. Hamilton, 566 N. 12th St., Philadelphia
Edw. Harrington, Son & Co., 17th and Callow-
ill, Philadelphia
William & Seyfang, 167 Vine St., Philadelphia
Humphreys Christian Co., 325 N. 8th St., Philadelphia
Thomas J. Hunter Co., 148 N. 7th St., Philadelphia
William S. Kalbach, 2272 Wood St., Philadelphia
T. B. Lauder & Son, 1845 N. 16th St., Philadelphia
John McConville, 35 N. 2d St., Philadelphia
H. A. May Foundry Co., 50th & Chestnut Sts., Philadelphia
Meerbach & Schneider, 1622 Vandyke St., Philadelphia
Thos. Mills & Bro., Inc., 1301 N. 8th St., Philadelphia
Frank Pettit Ornamental Iron Works, 599 Master St., Philadelphia
Quaker Caster Pattern Works, 501 N. 12th St., Philadelphia
Isaac A. Sheppard & Co., Erie Ave. & Sepivia,
The Tioga Foundry Co., 23d & Allegheny, Philadelphia
Union Machine Works & Iron Fdy., 1521 S. Water St., Philadelphia
V. W. Mfg. Co., 1636 North St., Philadelphia
W. J. Webb, 52 Cherry St., Philadelphia
W. W. Hamilton, Jr., & Co., Inc., 25th & Wash-
ington Ave., Philadelphia
Wickes Bros., Philadelphia
Phoenix Iron & Steel Co., Philadelphia
Phoenix Machine Co., Phoenixville
American Steel Foundries, 58th & A. V. Ry., Phila-
delphia
Axtelma Mfg. Co., 243 Third Ave., Pittsburgh
Eise Mfg. Co., Pittsburgh
Thomas Carlins Sons Co., 1900 River Ave., Pitts-
burgh
Duquesne Steel Foundry Co., 100 Arrott Bldg., Pittsburgh
Eipling-Carpenter Co., 1st & A. V. Ry., Pitts-
burgh
Fort Pitt Mal. Iron Co., Box No. 1054, Pitts-
burgh
Iron City Sanitary Mfg. Co., 1514 Oliver Bldg., Pitts-
burgh
Lewis Foundry & Machine Co., Box No. 1397, Pittsburgh
McConway & Toole Co., 48th & A. V. Ry., Pitts-
burgh
McDowell & Co., Galveston & Western, N. S., Pitts-
burgh
Mackintosh, Hempfill & Co., 27th & Etna Sts., Pitts-
burgh
The Marine Mfg. & Supply Co., Water St., Pittsburgh
The Phoenix Glass Co., Box 751, Pittsburgh
Pittsburgh Electric & Mfg. Wks., Barber Place,
Pittsburgh
Pittsburgh Malleable Iron Co., Pittsburgh
H. K. Porter Co., 49th & A. V. Ry., Pittsburgh
G. & J. Riebeck, 35th St., Pittsburgh
Sigwart & Rolatcn Mch., Works, Cor. Garrison
Place & Duncomway Way. Pittsburgh
The Simonds Mfg. Co., 25 Liberty Sts., Pitts-
burgh
Sletz Mfg. Co., 236 3rd Ave., Pittsburgh
Standard Pattern Co., 25th St., Pittsburg
Union Fdy. & Machine Co., Pittsburgh
Union Switch & Signal Co., Braddock Ave., Swis-
sett, Pittsburgh
H. L. Walter Lbr. Co., Fayette & Manhattan
Ave., Pittsburgh
Punsatuaneway Fdy. & Machine Co., Punsu-
tawney
Roberts, Winner & Co., Quakertown
Philadelphia & Reading Ry. Co., Reading

The S. G. V. Co., Reading

John G. Speidel, Reading

Buckwaltz Stove Co., Royersford

Grandier Stove Co., Royersford

S. G. Barker & Son, Scranton

Delaware, Lackawanna & Western R. R. Co., Scranton

The National Malleable Castings Co., Sharon

Sharon Foundry Co., Sharon

Bennett Steel Co., Bethlehem

Keystone Stove Co., Spring City

The Pennsylvania Steel Company, Steelton

Univ. Signal Co., Pittsburgh, Switzerland

B. F. O. Messinger Mfg. Co., Tatamy

The Westinghouse Machine Co., Trafford

Verona Steel Castings Co., Verona

Frick Co., Waynesboro

Granger & Co., Waynesboro

Landis Machine Co., Waynesboro

Landis Tool Co., Waynesboro

General Refractories Co., West Decatur

Leather Valley Co. & Oxer Bros., Inc., Wilkes-Barre

Vulcan Iron Works, Wilkes-Barre

Simmons Wood Working Co., Williamsport

Westinghouse Air Brake Co., Wilmerding

Harrison-Walker Ref. Co., Woodland

H. F. Farquhar & Co. Ltd., York

Hench & Irungold, York

Pullman Motor Car Co., York

**PIPPES, TOBACCO**

William Kaffer, 113 N. Orianna, Philadelphia

Shaw & Leopold, Randolph & Montgomery

L. Naz, 168 Noble, Philadelphia

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(Including Sash, Doors and Blinds, and General Millwork)

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A. A. Albright, Seal, Allentown

Butz-Frederick & Co., Allentown

Altoona Concrete Construction & Supply Co., Altoona

Altoona Construction Co., Altoona

H. S. & C. S. Barthley, Altoona

D. Commanan & Son, Altoona

R. D. Elder Lumber Co., Juniata (Br. P. O.), Altoona

J. B. Fluke & Son, Altoona

J. C. Ivory, Altoona

Penn. Railroad Car Shops, Altoona

Penn. Railroad Juniata Shops, Altoona

H. S. Nunemaker, Altoona

Ohio Valley Lumber Co., Ambridge and Economy

East Penn. Lumber Co., Inc., Analomink

D. L. Saylor & Sons, Ansonia

W. W. Wallace & Co., Apollo

Adam Waldern, Ashland

Dahoeck Lumber Co., Ashland

J. J. Weber, Ashville

Combev & Harris, Athens

C. F. Thayer, Atlantic

H. J. Haworth, Bonnnaire

Samuel F. Friedline, Bakersville

John Stauffer, Bald

Banger Lumber Manufacturing Co., Bangor

Wise Lumber & Coal Co., Bangor

Barnesboro Lumber Co., Barnesboro

T. F. Paller, Bangor

Anderson & Cook, Beaver

Beaver Falls Planing Mill Co., Beaver Falls

Coomera Co., Beaver Falls

T. S. Mitchell & Sons, Beaver Falls

Rhodes & Garvin, Beaver Falls

Reed & Spald, Beaveropoly

Arland Planing Mill, Bedford

Bedford Planing Mill Co., Bedford

Belleville Lumber Co., Bellefonte

P. B. Crider & Son, Bellfonte

T. R. Hamilton, Bellfonte

Belle Vernon Planing Mill Co., Belle Vernon

Joseph M. Young & Co., Bellville

Jonas Benfer, Beren

R. T. Smith & Son, Benton

Berrick Lumber & Supply Co., Berwick

Harry Fohring, Berwick

Bersy Millwork & Lumber Co., Berwyn

E. L. Lawver, Berwick

Andre Lumber Co., Blairsville

Columbia Plate Glass Co., Blairsville

A. R. Hartman, Bloomsburg

Richler Bros., Bloomsburg

H. A. Cline, Boggsville

S. W. McLean, Bolivar

Dreka Lumber Co., Boswell

Manist Lumber Co., Headquarters, Elk Lick, Bonneville

Bradock Lumber Co., Braddock

McFiege Bros., Braddock

Price & Alman, Braddock

H. C. Hems, Bradford

Tuna Manufacturing Co., Bradford

W. H. Mcclatt, Breezewood

I. F. March's Sons, Bridgeport

Anderson Lumber Co., Brookville

J. C. Lucas, Brookville

Vanluer Bros., Brookville

Brownsville Construction Co., Brownsville

Irwin Arnold, Buffalo Mills

J. H. Patchen, Bensville

Butler Planing Mill Co., Butler

Cumberland Lumber Co., Butler

John R. Powell's Sons, California

C. W. Blystone & Son, Cambridge Springs

Phoenix Lumber Co., Cambridge Springs

G. M. Coon, Canton

H. Crawford & Sons, Canton

The Homestead Co., Carrydine

A. J. Hoole, Caroline, N. B. Robinson, Carbondale

The Beemum Lumber & Manufacturing Co., Carlsbad

Carnage Mill & Lumber Co., Carnegie

H. J. & W. A. Krumenacker, Carlottown, R. D. G. M. Green, Cassville

Franklin Goldsmith & Son, Catasaquenna

Zetllo Bros., Center Hall

A. C. Kelly, Center Moreland

G. D. Cole, Center Road Station

C. P. Blackburn, Cresson, R. D.

Bair & Rasdinder, Chambersburg

L. T. Knowler, Chambersburg

Geo. A. Minnick & Son, Chambersburg

H. F. Pakin & Co., Cherryville

Charlelo Lumber Co., Cherryville

Stracey G. Gauler & Son, Chester

James M. Hamilton, Chester

R. D. Kimpeart, Cherry Tree

E. Somerville, Cherry Tree

F. P. Frederieck Co., Chicora

Davis Lumber & Planing Mill, Christiana

Wangemann Manufacturing Co., Clearfield

J. C. McElhatten, Clarion

Summit Lumber Co., Clarks Summit

F. J. Egan, Claysville

Clearfield Millwork & Lumber Co., Clearfield

Gearhart & Wright, Clearfield

Samuel State, Cleo

S. Favgangy, Sons, Coalport

J. W. Meyer, Cohown

Andrew Vennard, Cohown

Shaffer Bros. & Nelson, Cochranburg

J. Jay Wilder, Columbia

E. E. Peckham, Columbia Cross Roads

Conference Lumber Co., Conference

R. H. DeArment, Connet Lake

V. H. Denniss, Connent Lake

Stites Bros., Connent Lake

Connorville Planing Mill Co., Connellsville

Fayette Lumber Co., Connellsville

Keystone Planing Co., Connellsville

South Connellsville Lumber Co., Connellsville

Wm. Potts Jones, Consobenchoke

The A. L. Miller Co. Consobenchehen

Isac D. Shaffer, West Consobenchehen Consobenchoke
The A. L. Miller Co., Conshohocken
Wm. Shilling, Cool Spring
McKeen, Hanover
H. A. Button, Connersville
James S. Swiner, Cowanesque
Ingram Lumbe & Supply Co., Pittsburgh, Craf-
town (Br. P. O.)
Ed O'Brien, Cresson
George C. Graham, Damascus
Danville Lumber Co. (Mill at Milanville), Dan-
vill
Conshohocken Millwork Co., Darby
Stubbs & Culp, Delta
Denver Planing Mill, Denver
Allen Lumberton
H. E. Quikel, Dover
Frank J. Gerhartz, Dogtown
F. L. Worthington, Dogtown
J. C. Doyle, Dry Run
A. D. Hoover Woodworking Co., Dubola
G. W. Piper Sons, Dubola
George Smyers, Dubola
George X. Bingham, Scranton, Dunmore (Br.
P. O.)
Ziegler Lumber Co., Duquesne
Graham Lumber Co., East Brady
Fitzgerald-Spear Co., Easton
J. Monroe Young, Easton
Rushton Lumber Co., Morrisville Ave., Turtle
Creek, East Pittsburgh
East Stroudsburg Lumber Co., Inc., East
Harmony Borough
S. M. Milliken, East Waterford
Ebensburg Planing Mill Co., Ebensburg
Robert T. Wade, Ebensburg
Elizabeth Planing Mill Co., Ebensburg
H. H. Brant, Ebensburg
L. C. P. Stout, Easton
National Supply & Construction Co., Ellwood
City
Urbain Sloan's Planing Mill, Emlenton
L. L. Fisk, Emporium
E. T. Goody, Eon Valley
Ephrata Planing Mill Co., Ephrata
George Carroll & Bro. Co., Erie
The Constable Bros. Co., Erie
A. A. Denning, Erie
Lyman Folheim, Erie
James D. & Heisinger, Erie
Kirchner Bros., Erie
D. S. Milloy, Erie
D. Schlosser, Erie
Henry Shenk Co., Erie
Collins Bros., Espyville
The Edward Daniel Co., Evans City
Earlston Planing Mill Co., Everett
Everett Planing Mill Co., Inc., Everett
Export Lumber Co., Everett
M'Coremick Lumber Co., Fairchance
B. F. Beers, Fallentimer
Falls Creek Planing Co., Falls Creek
Fawn Grove Lumber Co., Fawn Grove
James Patterson, Fayette City
Finley Bros. Co., Finleyville
A. T. Mullins, Linclon Falls, Fortville R. D.
Joe S. Rots, Fort Loudon
Haupt Bros. & Co., Frackville
American Steel Foundries, Franklin
The James Lumber Co., Franklin
Marsteller Bros. Lumber Co., Fredonia
W. T. Mohler, Freedom
Freepoint Planing Mills Co., Freeport
A. King & Sons, Freeport
Fredens Planing Mill Co., Friedens
M. Schults, Gallatin
Albert Adel, Geneva
W. L. Adsit, Geneva
George W. Stolzman, Gettysburg
Glassport Lumber Co., Glassport
Glen Manufacturing Co., Glen Rock
Glenville Lumber Co., Glenville
W. G. Doughman, Grampian
Greencastle Elevator Co., Greencastle
J. C. Reed, Greensburg
South Greensburg Lumber Co., Greensburg
Struble & Walthour, Greensburg
Chas. C. Baker, Greensburg
Helman Lumber Co., Greensville
Keg Planing Mill & Supply Co., Grove City
McKee Planing Mill Co., Grove City
L. B. Walbert, Hancock
John F. Rohrbach, Hancock
Union Planing Mill Co., Inc., Harrisburg
E. B. Koons, Harveyville
Summiters Bros., Havengton
Atkinson Box & Lumber Co., Hawley
H. F. Bright Lumber Co., Hazleton
Hazelton Manufacturing Co., Hazleton.
Hellman Lumber Co., Hazleton
Pennsylvania-Maryland Coal Co., Hollidays-
burg Manufactury Co., Hollidays-
burg Manufacturing Co., Hollidays-
burg Lumber Co., Hollidays-
burg M. S. Hunter & Sons, Hollidays-
burg Noah Ott, Hollidol
Feath & Kerr, Homestead
George M. Hall & Co., Homestead
Homestead Lumber Co., Homestead
Pennmar Manufacturing Co., Honesdale
H. G. Hamer, Honesdale
Charles H. Sechler, Honesdale
M. Gillis, Honeslal
Huntingdon Millwork & Lumber Co., Hunting-
don
W. J. O'Mara, Huntington
W. F. Patterson, Huntingtown
Benjamin Gibson, Huntingtown
James M. Ahlhorn, Hyndman
Hyndman Lumber & Supply Co., Hyndman
W. S. Douglas, Hyndman
Indiana Lumber & Supply Co., Indiana
W. R. Sparks, Indian Head
Irwin Lumber Co., Irwin
M. J. Snodgrass, Jamestown
T. B. Hapner Lumber Co., Jeannette
Union Planing Mill & Lumber Co., Jeannette
W. C. Nicholson & Co., Jeraym
Cameron & Lambert, Jordan's Store
Cambria Steel Co., Johnstown
Conemaugh Lumber Co., Johnstown
Johnston Bros., Johnstown
Johnstown Planing Mill Co., Johnstown
The Thomas Kingsley Lumber Co., Johnstown
The Lomax Co., Johnstown
David Ott & Co., Johnstown
Wm. F. Smith Bros., Johnstown
Levi M. Thomas, Johnstown P. O.
Kane Blind & Sreen Co., Kane
Peterson & Skoglund, Kane
Empirorium Lumber Co., Kane
Kane Lumber Co., Kanefiing Summit
C. G. Gawthrop Co., Kennet Square
J. V. Vansalk & Wilkes-Barre, Kingston
(Br. P. O.)
John B. Senger & Sons, Kingers
P. S. Fats, Knox
American Planing Mill Co., Kittanning
Helman Bros. Lumber Co., Kittanning
Henry Shaffer Lumber Co., Kittanning
West Kittanning Lumber Co., Kittanning
W. W. Bowman, Knox
I. M. Grover, Knoxville, Knoxvlle
H. F. Kreamer, Kreamer
Heffner & Savage, Knotts
J. Bailey & Co., Kunkletown
A. L. Vandervort, Laceyville
Witherl P. B., Laceyville
John F. Johnson, Ligonier
Herr, Draper & Co., Lancaster
Keystone Planing Mill Co., Lancaster
The Wm. L. Planing Mill Co., Lancaster
Jacob W. Drescher, Lansdale
Wm. C. Sinster, Jr., Lansdowne
George H. Anderson & Sons, Inc., Latrobe
Miller Bros. Inc., Lebanon
Leechburg Lumber Co., Leechburg
Lehighton Lumber Co., Lehighton
E. K. Fraser, Lemoyne
H. M. Stauffer, Leola
Le Raysville Furniture & Toy Mfg. Co., Le
Raysville
Kulp Planing Mill Co., Lewistown
R. H. Miller, Liberty
Ibhr Bros., Ligonier
International Silo Co., Linvsville
Keath-Shields Planing Mill Co., Litzitz
Neidmeyer Bros., Litzitz
C. F. Wilber, Glensdale
George J. Julius & Bro., Littletown
K. D. Batcher, Lock Haven
Clifton Furnace, Lock Haven
Hippa Estate, Lock Haven
H. E. Ruggles, Wilkes-Barre, Luzerne
(Br. P. O.)
Frank L. Underwood, Luzerne
N. C. Shillingford, McAlester
Wm. C. Steller, McAllister
P. F. Black, McConnellsburg
Wm. S. Clevenger, McConnellsburg
Speagle & Hunter, McConnellsburg
Downie & McComb, Mercersburg
John Calvert, McKees Rocks
John Davis & Co., McKees Rocks
Elmer Nesbitt, McLane
Wengel, Lillo W.
Thomas J. Wm.
Wilson C.
O. H. Allen, Meshoppen
J. M. Stillwell, Meshoppen
Meyersdale Planing Mill, Meyersdale
Kern & Triss, Middleburg
Aaron Steet's Estate, Middleburg
John, B. Brindle, Millfinn
Eocene Miller, Millinburg
Eiel C. Rudy, Millinburg
Kensey Bros., Milford
A. Donen Planing Mill Co., Millersburg
Millersburg Manufacturing Co., Millersburg
J. F. Kerr, Marsh Run, Millersburg P. O.
Rubie & Watson, Millmont
C. A. Sweigard, Millmont
Bennett Lbr. & Mfg. Co., Pittsburgh, Millvale
(Br. P. O.)
L. W. Waterhouse, Mill Village
Edward Buck, Millville
Greiville Robbins, Millville
D. Clinger & Sons, Milton
Jacoo Fetters' sons, Milton
Anthracthe Lumber Co., Minersville
Mott Lumber Co., Monessen
Westmoreland Lumber Co., Monessen
Moneghan Saw & Planing Mill Co., Monongahela
Vlohe Bros., Monongahela
Evon Furniture Co., Montgomery
William T. Landry, Montoursville
W. H. Landry, Montoursville
Spring Brook Lumber Co., Mosaic
L. W. Hart, Morris
F. H. Hart, Nanvoo, Morris P. O.
T. B. Stockham & Bro., Morrisville
C. P. Van Brunt Manufacturing Co., Moscow
Geiger Gibson & Co., Mount Carmel
Barnard Carrel Lumber Co., Mount Carmel
Lemley Bros., Mount Morris
H. H. Heiser (Mill at Shadde), Mount Pleasant Mills
A. S. Wehn, Mount Union
Edward F. Ives, Meyersdale
Emice B. Haas, Meyersport
S. B. Price & Co., Nanticoke
Susquehanna Lumber Co., Nanticoke
Nazineh Planing Mill Co., Natsareth
C. 0. Solomon, New Berlin
R. B. McDaniel Co., New Brighton
Maltsoff Bros., New Brighton
D. F. Fair, New, Buena Vista
Kline Lumber & Construction Co., New Castle
Mahoning Valley Lumber Co., New Castle
New Castle Lumber & Construction Co., New Castle
Shenango Lumber Co., New Castle
Wallace Bros., Mahoningtown Sta., New Castle
Thomas Krischer, New Florence
W. E. Jones, New Park
Northeast Planing Mill, Newport
A. W. & W. M. Watson Co., Newtown
George & Clyde Pratt, Nicholson
Lorenz Wright Co., Nicholson and Factoryville
H. J. & Wm. Kranecker, Nicktown
W. A. Baier, Nisbet R. D.
Greater Body Co., N unintown
Stow Lumber & coil Co., North East
O. M. Wehberger Co., North Wales
Klieg Bros., Oakdale
C. F. Reed & Bro., Oakmont
J. W. Bailey, Oliphant
Edouard & Edmond Lumber Co., Oil City
Caldwell Lumber Co., Oil City
Kistler Lumber & Coal Co., Oil City
Wilson & Carothers, Oil City
L. F. Mickley, Orrtows
Oescosa Lumber Co., Oescosa Mills
R. J. Walker, Oescosa Mills
Wm. Adams, Osterburg

Harry Hilman, Oxford
W. G. Sigler, Paintersville
New Jersey Zinc Co. (of Pennsylvania), Pal
merber
Early & Wengel, Palmyra
Palmyra Brick Manufacturing Co., Palmyra
W. M. Ross & Sons, Parkersburg
A. P. Reid, Parkersburg
J. C. Lucas & Sons, Parkersburg
Twist & Hippensteel, Wilkes-Barre, Parsons
(Fir. P. O.)
Fittsburgh Property Co., Pen Argyl
Harry Shaffer, Penn Run
Pennsburg Manufacturing Co., Pennsburg
J. B. Wilson, Penn Station
C. E. Fox, Pekasisa
S. R. Skocoke, Perkiomenville
Daniel Adams, 240 North Marshall St., Philadelphia
Ellwood Allen Lumber Co., Trenton Avenue & Ann St., Philadelphia
Isaac Ambrose, 118 Stielhe, Philadelphia
Charles Anderson, 1629 North 10th St., Philadelphia
Bailey & Co., 240 New St., Philadelphia
John Sibert & Chanceller, Philadelphia
Gustave Berger, 1143 N. Front Street, Philadelphia
John J. Cremoni, 1128 Harrison Street, Philadelphia
D. R. Crumrine, 301 Edgewood, Philadelphia
Philadelphia Mill, 2611 S. Neshamina St., Philadelphia
John A. Dubs, 229 S. Fifth St., Philadelphia
Escoom & Roese, 129 W. Susquehanna Ave., Philadelphia
Chas. Feldine Co., York Road and Butler
Philadelphia
Fite & Arbele Co., 20th and Glenwood
Philadelphia
Fritz & La Rue, 1124 Chestnut St., Philadelphia
Frederick Gerry & Co., Schyullkill Ave. and Peltz
Street, Philadelphia
Wm. E. Gibson, 5527 Market St., Philadelphia
T. H. Grigg, Lancaster Ave. and Baring St., Philadelphia
Hale & Kilburn Co., 18th Street and Lehigh Ave., Philadelphia
Hall Bros. & Wood, 5th and Lancaster Ave., Philadelphia
Edward F. Benson & Co., 521 N. Delaware
Philadelphia
Hoeling Bros., 313 S. Lawrence, Philadelphia
Ernest Hoffman (Est.), 1124-26 Washington Ave., Philadelphia
Solomon Horn, 615 Pine Street Philadelphia
Charles F. Myers, 3077 Janney St., Philadelphia
Joseph W. Janney, 1147 Beach St., Philadelphia
John Jones, Doll & Co., 323 North 22nd St., Philadelphia
S. S. Keely & Sons, Main and Umbria Streets, Philadelphia
Kestenbaum Lumber Mill, 1525 E. York Street, Philadelphia
Joels Kirchgraber, 613-15 Cherry St., Philadelphia
Charles B. Klince, 35 South 16th St., Philadelphia
George W. Kgler & Sons Co., 219 New Market Street, Philadelphia
Duvall W. Lance, 721 W. Tioga St., Philadelphia
Richard Lloyd, 155 North 23rd St., Philadelphia
T. W. Haeger & Son, 1545 North 10th Street, Philadelphia
Joseph Miles, River Road, Manorunck Station,
Philadelphia
A. F. Miller, 239 S. Hutchinson, Philadelphia
Peter C. Osada & Co., 1453 S. Front Street, Philadelphia
John Parker & Son, 16th and Fitzwater Streets, Philadelphia
Penhurst Lumber & Coal Co., 25th and Collowhill Streets, Philadelphia
Philadelphia Screw Manufacturing Co., 56th and Woodland Avenue, Philadelphia
Stacey Reeves & Sons, 671 Filbert Street, Philadelphia
A. W. Renninger, 2309 6th North St., Philadelphia
William Russel Woodworking Co., 205-29 Chest
Street, Philadelphia
Seymour Bros., 340 Lee Street, Philadelphia
Shea & Van Gerves Co., 1st-52d W. Lawrence Street, Philadelphia
PLANTING MILL PRODUCTS—Continued

Silberman & Fleisher, 1238 Mascher Street, Philadelphia
Snedley Bros. Co., Church and Tacony Streets, Philadelphia
N. F. Reede, Manufacturers, Pittsburgh
Robert Talke & Son, 413-17 S. Fifth Street, Philadelphia
Tucker & Stachel, 167 East Allen St., Philadelphia
Martin H. Wairath, Broad and Cambria Sta., Philadelphia
Joseph T. Ward, 5800-19 Baynton Street, Philadelphia
Watson & Robinson, 49 Queen Street, Germantown Sta., Philadelphia
A. Wilt & Sons, 722 N. Front St., Philadelphia
Fred V. Yeager, 118-18 S. 36th St., Philadelphia
D. Grebe & Son, Phillipsburg
Phillipsburg Planing Mill Co., Phillipsburg
Phoenix Machine Co., Philadelphia
George C. Fry & Son, Picture Rocks
Chas. Werner, Franklin Grove
Leslie Summer & Supply Co., Pitsahirm
Ahlers Lumber Co., 328 E. Ohio St., N. Chicago
Benon Avon Lumber Co., Spruce Street & Brighton Road, N. S., Pittsburgh
Robert Francis Co., 8 15th & Mary Streets, Pittsburgh
Andrew Bonsen, 150 South 38th St., Pittsburgh
Schulick & Co., 3516 Fort Pitt Blvd., Pittsburgh
Truckman Lumber Co., Pittsburgh
Edward A. Caler, 631 Industry St., Pittsburgh
Diebold Lumber & Manufacturing Co., 93 Wash Street, Pittsburgh
M. Diebold Lumber Co., E. Liberty Station, Pittsburgh

Pittsburgh Branch Post Offices.

Ingram Lbr. & Supply Co., 2 Prospect Ave., Ingram, Crafton, Pittsburgh
Bennett Lbr. & Mfg. Co., 235 Sedgewick St., Millvale, Pittsburgh
Colonial Floor Co., 1894-44, Sharpsburg, Pittsburgh
Daniel Whitmore & Co., Hiel Ave., Wilkinsburg
Wilkinsburg Stair & Mfg. Co., Penn Ave. & West Alice St., Pittsburgh
W. F. Young Co., 598 Hay St., Wilkinsburg, Pittsburgh
The Dutch Lumber Co., Inc., Pittston
J. E. Patterson Co., Pittston
Wyoming Valley Lumber Co., Pittston
J. W. Cook & Sons, Point Marion
Clark Bros. & Co., Plymouth
John A. Clarke, Point Marion
A. S. Reeder & Co., Point Marion
Point Marion Lumber Co., Point Marion
Leroy Porson, Portland
H. G. Miller, Potter Brook
E. S. Potter, Potter Brook
L. M. Poll, Potts Grove
Josiah Frederick, Pottstown
William Buechley & Son, Pottsville
Krieg Bros., Pottsville
The Saltus Planing Mill & Lumber Co., Pottsville
Walter Wertsley Cott, Pottsville
James K. Long & Son, Lindsey Station, Punxsutawney
McKean, Hare & Son, Punxsutawney
Peck & Young, Punxsutawney
Punxsutawney Planing Mill Co., Punxsutawney
Sluss Miller, Purell
G. F. Smith, Purell
Henry A. Good, Quincy
Neverstick Planing Mill, Reading
Moore Snowdon Mill Co., Reading
Philadelphia & Reading Railway Co., Reading
Sheeder Planing Mill Co., Reading
C. C. Bierly, Riverside
D. J. Rumble, Red Hill
Noah C. Stabler, Red Lion
Joseph M. Young & Co., Reedsdale
Isaac H. Lebo, Reinholds Station R. D.
Philip Reitz, Relix
L. D. Stine, Relitz R. D.
G. D. Duberry & Co., 41st St. & A. V. Ry., Pittsburgh
Elmer Lumber & Mill Co., 802 23rd St., Pittsburgh
Henry J. Frey, Kaiser & Hasluge Aves., Pittsburgh
George Evans Lumber Co., Ltd., 167 Warrington Ave., Pittsburgh
Jacob Haney, 912 Lincoln St., Pittsburgh
R. W. Hare, 722 Penn Ave., Pittsburgh
L. J. Higgins Lumber Co., 33rd & Liberty Ave., Pittsburgh
Edwin W. Hill, 2601 Penn Ave., Pittsburgh
Interior Finish Co., Beaver Ave. & Fayette St., Pittsburgh
T. W. Darby, 2003 Penn Ave., Pittsburgh
The Keystone Lumber, S. 17th & Merriman St., Pittsburgh
R. A. McColl Lumber Co., Putnam near Franks-town Avenue, Pittsburgh
Frank McFeeley, 520 W. Reliance St., Pittsburgh
The May Lumber Co., 1291 Irwin Ave., Pittsburgh
George B. Monks, 8-12 Ketchum St., N. S., Pittsburgh
North America Lumber Co., 809 North Ave., N. S., Pittsburgh
Pittsburgh & Lake Erie R. R., Pittsburgh
Pennsylvania Door and Sash Co., 900 Second Ave., Pittsburgh
Phoenix Glass Co., P. O. Box 757, Pittsburgh
A. H. Fowler Redman Manufacturing Co., 145 McClure Ave., N. S., Pittsburgh
M. Simon's Sons, 121-127 Anderson St., N. S., Pittsburgh
H. R. Walter Lumber Co., Fayette & Manhattan Aves., Pittsburgh
Wiggins Lumber Co., S. 15th & Wharton St., Pittsburgh
Young & Schmidt, 5209 Carson St., Pittsburgh

Oil City Woodworking Co., Reno
J. H. Baird, Renovo
The Woodward Supply Co., Reynoldsville
Arthur Westgate, Riceville
W. B. Shrawder, Richfield
Hyde-Murphy Co., Ridgeway
Riegelsville Mfg. Co., Riegelsville
Wallace A. Hoover, Riverside
Wallace Hoover & Bros., Riverside
Pittsburgh Planing Mill Co., Roaring Spring
H. C. Fry Glass Co., Rochester
David Hawk, Rochester Mills
J. P. Exeter & Son, Rockwood
Schock Bros., Rockwood
O. O. West, Rogersville
C. L. Jones, Pottsville
Bush Bros., Royersford
McKelvey & Peters, Rural Valley
Henry Untz, Saco, Maine
Byron W. Stebbins, Saegertown
Schantz Brothers Manufacturing Co., Saint Mary's
L. H. Knapp, Salona
Kimmell & Cornelius, Salt Hill
George H. Rhea, Saltburg
Baker & Cary, Sarre
J. S. Hart, Savre
Charles S. Metzgar, Scota
W. A. Pentz, Scotland
Broadway Planing Mill, Scottdale
J. W. Ruth, Scottsdale
John Reams, Scranton
George H. Bingham, Dunmore (Br. P. O.)
Saranon
Brown Bros., Scranton
Burcher & Robinson, Scranton
Delaware Lackawanna & Western R. R., Scranton
De Witt Lumber Co., Scranton
Hagen Lumber Co., Scranton
L. H. Thomas, Scranton
Nay Lumber Co., Scranton
Peck Lumber Manufacturing Co., Scranton
Washburn, Williams Co., Scranton
J. B. Woolsey & Co., Scranton
East End Planing Mill, Co., Saxton
Harper Bros., Shade Gap
W. G. Piper, Shade Gap
Baship Brothers, Shamokin
East End Lumber Co., Shamokin
PLANNING MILL PRODUCTS—Continued

H. P. Raup & Sons, Shamokin
Shamokin Lumber Manufacturing Co., Shamokin
W. G. Berkey, Shamokin
Walker & Lowry, Shamokin
Chas. C. Baker, Sharon
John Cook & Son, Sharon
Rise Cook & Son, Sharon
J. M. Heard & Sons, Sharon
Walvis & Carley Co., Sharon
A. Wishart & Sons Co., Sharon
C. C. Weaver & Sons, Sharon
Bizby & Son, Sharon Center
E. L. Gaines & Sons, Shapsville
Frank W. Wiles, Shapsville
G. R. Wood's Sons Co., Sheffield
Shickshinny Lumber Co., Shickshinny
D. R. Becker Planing Mill, Shillington
Builders Home Supply Co., Shinglehouse
W. S. Snake, Shippenburg
J. P. Komesor & Son, Shunk
C. F. Schultze, Silver Creek
John H. Glassmerer, Sinking Spring
L. L. Texter, Sligo
W. J. Rule, Rule Mills, Smithfield P. O.
C. W. Mitchell, Sneedsville
Berkelle Lumber Co., Somerset
Globe Column & Mfg. Co., Somerset
Somerset Door & Column Co., Somerset
Somerset Lumber Co., Somerset
Heming & Son, Souderon
Brown Rork Manufacturing Co., South Bethlehem
Robert Pfeife, South Bethlehem
Perry Gilpin, South Sterling
Geo. Lakes, South Stirling
D. H. Deener, Springhope
C. P. Long, Spring Mills
Stotler Planing Mill, Steelton
Stewartown Lumber & Mfg. Co., Stewartstown
John T. Long, Summerhill
Andrew Brinlin, Summerhill
Titman Hents, Summithill
Mattie & Erdman, Sunbury
Sunbury Planing Mill Co., Sunbury
Deakin & Aug, Susquehanna
J. B. Sikes, Sykesville
Henry Becker, Tanamua
J. A. Schilbe, Tamaqua
Hough & Leard Co., Ltd., Tarentum
The Tarentum Lbr. Co., Tarentum
E. H. Harman, Tontown
Ben Lesher, Tontown

Wilkes-Barre Branch Post Offices.

J. F. Seward & Co., Kingston, Wilkes-Barre
H. W. Ruggles, Lazear, Wilkes-Barre
Frank L. Enderle, Lazear, Wilkes-Barre
Twist & Hippensteel, Parsons, Wilkes-Barre
Hart Planing Mill Co., North Ave. & Pitt St., Wilkes-Barrer
Wilkes-Morgan Planing Mill Co., Pittsburg
Dan't Whitmore & Co., Wilkinsburg (Br. P. O.)
Wilkinsburg Stair & Mfg. Co., Wilkinsburg
W. F. Young Co., Wilkinsburg (Br. P. O.)
F. B. Sherman, Williamsport
John Coleman, Williamsport
W. D. Crooks & Sons, Williamsport
Goertz Carving Co., Williamsport
Loyalsock Planing Mill Co., Williamsport
Simmons Wood Working Co., Williamsport
William Black, Williamsport
Vollath & Planing Mill Co., Williamsport

PLUMBER'S

Westmoreland Lumber Co., Monessen
Habuck & Kilburn Co., 15th & Leigh Ave., Philadelphia

PRINTING

The W. O. Hickle Mfg. Co., Harrisburg
Joseph Adams, 1226 N. Alden, Philadelphia
American Electrotype Co., 706 Market St., Philadelphia
American Type Founders, 17 & 29 S. Sixth St., Philadelphia
Chas. S. Schub Co., 14 and 15 S. 5th St., Philadelphia
Duncan & Co., 621 Commerce St., Philadelphia
Franklin Electrotype Co., 224 So. 5th St., Philadelphia

H. G. Mapes, Tionesta
W. D. Harrison, Titusville
D. L. Routt, Titusville
I. L. Shank, Titusville
Humphrey Mfg., Tinnadu
D. Snyder & Son, Tower City
Park E. Wood, Townville
F. P. Case & Son, Towne
G. Dow Dewitt, Tunkhannock
A. B. Harris, Tunkhannock
Wm. Gifford, Tunkhannock
Jno. B. Bear, Tyrone
F. D. Boyer & Co., Tyrone
Perry Bingham, Ulysses
Callifish Bros., Union City
H. Clark & Son, Union City
Douglas & Yale, Union Dale
Carroll Lumber Co., Uniontown
Chas. F. Eggers, Uniontown
South Penn Bldg., Uniontown
Magleve, McClure & Co., Vanderhill
W. J. Reed, Vanderhill
C. C. Shaffer, Varden
S. Heilmy, Virginia
Pickett Lumber Co., Warren
L. D. Wetmore Co., Inc., Warren
Vester, Stewart & Rossell Co., Washington
Wallace & Slater, Washington
Watsontown Door & Sash Co., Watsontown
U. G. Stoner, Waynesboro
W. L. Blair, Waynesboro
J. A. Culver & Co., Wellsboro
Harkness & Berdon, Wellsboro
J. C. & S. A. Speer, Wellsboro
Wolfenberger & Feather, Wernersville
S. C. Black, West Chester
E. P. W. H. Griffith, West Chester
Jane D. Shaffer, West Conshohoken
Lans & Sholls Co., West Fairview
C. E. Neff, West Newton
Wesley L. Beam, West Point
J. C. McDonald, West View
H. W. W. Whites, Whites Valley
The Goff Lumber Co., Wilkes-Barre
Koche & Mowery Co., Wilkes-Barre
Conrad Lee, Wilkes-Barre
E. T. Long & Co., Wilkes-Barre
Robinson Lumber Co. Wilkes-Barre
W. H. Shepherd & Son, Wilkes-Barre
The Steinheider Co., Wilkes-Barre

Wilkes-Barre Branch Post Offices.

Williamsport Planing Mill Co., Williamsport
Williamsport Woodworking & Building Co., Williamsport
Buckler Carbor
Windermere Lumber Co., Williamsport
D. N. Byers, Woodbury
Charles A. Anderson., Woodlawn
J. C. Fuller, Wyncising
W. John Stevens, Inc., Wyncote
Wilmer & Small, York
Frederick Blackmond, York
Henry G. Brockmein, York
Codrove Planing Mill, York
Geo. W. Gilbert, York
Home Furniture Co., York
Cassar H. Oermann, York
York Woodworking Co., York
Youngsville Lumber Co., Youngsville

Sanitary Specialties Co., 1924 E. Clearfield St., Philadelphia
Smeallie Power Co., Church & Tacony Sts., Frankford, Philadelphia
West York Furniture Mfg. Co., York

WOODWORK

MATERIAL

Gatchel & Manning, 6th & Chestnut Sts., Philadelphia
Hanson Brothers, 704 Sansom St., Philadelphia
Royal Electrotype Co., 629 Sansom St., Philadelphia
Henderson Shelp Mfg. Co., N. E. Cor. 6th St. & Columbus Ave., Philadelphia
Ship & Vandergift Co., 516 Lawrence St., Philadelphia
Weiskoff & Thompson, 12114 N. 12th St., Philadelphia
Geo. W. White, 721 Walnut St., Philadelphia
PULEYS AND CONVEYORS.

P. & R. R. R. Repair Shops, Catawissa
Edwards Mfg. Co., Laceysville
Eilpais Pulley Co., Meyersdale
Collinda McClint & Co., 702 W. Canal St., Philadelphia

W. W. Patterson Co., 54 Water St., Pittsburgh
Pittsburgh Block & Mfg. Co., 519 South Ave., North Side, Pittsburgh
Reading Wood Pulley Co., Reading
Bethlehem Steel Co., South Bethlehem

G. R. Wood's Sons Co., Sheffield
Standard Wood Pipe Co., Williamsport

REFRIGERATORS AND KITCHEN CABINETS.

J. D. Naftzinger, Centerport
Stevenson & Co., Chester
Banta Refrigerator Co., Clearfield
R. F. Klingsimus, Du Bois
W. H. Kelchner, Millville
J. Fisher and Co., 1236-18 N. 5th St., Philadelphia
Hale & Killburn Co., 15th St. and Lehigh Ave., Philadelphia
John Knowl & Sons, 171 Jefferson St., Philadelphia
McCracken & Hall, 1129 Washington Ave., Philadelphia
Thos. Mills & Bro., Inc., 1301 N. 8th St., Philadelphia
Midway Refrigerator Co., 5639 N. Lawrence St., Philadelphia
C. J. & A. Schad, 519 Bainbridge St., Philadelphia
H. Daniel Long, S. W. Cor. Front & Montgomery St., Philadelphia
Standard Refrigerator Co., 2548-49-50 Germantown Ave., Philadelphia
S. Delp's Sons, Fourth and Liberty Sts., Pittsburgh
Bernard Gloecker Co., 1127 Penn. Ave., Pittsburgh
The Specialty Mfg. Co., Titusville
H. A. Boyer, West Hanover

ROLLERS AND CURTAIN POLES.

Webb Mfg. Co., Brookville
Bernard McCurdy, 9th & Arch Sts., Philadelphia
Smedley Bros. Co., Church & Tacony Sts., Frankford, Philadelphia
Thomas Ott & Co., 1124-1126 Washington Ave., Philadelphia
R. M. Bowser & Son, Renfrew
Geo. H. Lancaster, South Sterling

SADDLES AND HARNESS.

Barton Mfg. Co., Irvind
Eagle Scotch Hame Manufacturers, 223 No. Lawrence St., Philadelphia
S. H. Easterbrook, 311 Cherry St., Philadelphia
Hessler Wagon Works, Inc., 857 E. Girard Ave., Philadelphia

SHIP AND BOAT BUILDING.

A. Long & Son, Albion
Rift Climbing Boat Co., Athens
Ray Hoffman, Bloomings
W. N. Foote & Son, Conneaut Lake
Hanser Bros., Delaware Water Gap
Dravosburg Dock Co., Dravosburg
Pashco Bros., Erie
John S. Shepherd, Emsington
Harrs Island, Coal & Sand Store Co., Harrisburg
Geo. V. Tompkins, Marcus Hook
Lehigh Coal & Navigation Co., Muncy
Thank
William Glass & Son, 776 N. 25th St., Philadelphia
Wesley Glenn, S. L. Tacony St., Philadelphia
U. S. Navy Yard, (Half Division), Philadelphia

E. F. Ward & Sons, Philadelphia
Hazeltwood Dock Co., Pittsburgh
The Monongahela River Consolidated Coal and Coke Co., 8 Market St., Pittsburgh
Newville Rock Co., 1218 Park Building, Pittsburgh
R. C. Price & Co., Foot Federal St., Pittsburgh
James Rees & Sons Co., Pittsburgh
H. R. Walter Lbr. Co., Fayette & Manhattan Aves., Pittsburgh
J. M. Samuel, Point Pleasant
Peek Lbr. Mfg. Co., Scranton
J. F. Coryell, Shamokin Dam
Bethlehem Steel Co., South Bethlehem
Forest Barge Co., Florence
U. S. Boat Yards, Lock No. 4
Doughlas & Yale, Union Dale
W. A. Stroman, Yorkhaver

SHUTTLES, SPOOLS, AND BOBBINS.

Allentown Bobbin Works, Allentown
Allentown Reed, Harness & Mill Supply Co., Allentown
Cheswold Leaf Mfg. Co., Carbondale
Arnold & Bro., Cooper'sburg

Excelsior Bobbin & Spool Co., Newtown
J. B. Brusher, Nenstattown
B. R. Dover, 1126 N. Orianna, Philadelphia

SPORTING AND ATHLETIC GOODS.

A. C. Kelly, Center Moreland
Onondaga Community, Ltd., Lillitza
Clark Heart Mfg. Co., 2419 Front St., Philadelphia
Clas. F. Foulkrod, 2228 Wood St., Philadelphia
John Grass Wood Turning Co., 222 Vine St., Philadelphia
Frank Rosato Co., 222 So. 8th St., Philadelphia
Geo. Wurthole & Sons, 1724 East St., N. S., Pittsburgh
Wm. Worthenty, 415 Diamond St., Philadelphia
Geo. H. Rhea, Salisbury
Holmes & Gillilan, Smethport
Becker Novelty Co., Spring Creek
J. H. Park, Warren
TANKS AND SILOS.

Penn. R. R. Car Shops, Altoona
P. & R. Ry. Repair Shops, Catawissa
Downing Tug Co., Downingtown
Grater Body Co., Norristown
Amos H. Hall Son & Co., 2915-2923 N. Second
E. F. Schlichter Co., 10 S. 15th St., Philadelphia
Woolford Wood Tank Mfg. Co., 1429 Chestnut St., Philadelphia
H. Elsesser & Bros., 1324 Ohio St., N. S., Pittsburgh
Flouting Tank Co., 315 Liberty Ave., Pittsburgh
H. R. Walter Lbr. Co., Fayette & Manhattan Ave., Pittsburgh
Ronseville Supply Co., Ronseville
John Benore, Scranton
International Silo Co., Linesville
F. P. Case & Son, Troy

TOYS.

J. T. Hammond & Son, Inc., 134 Hodge St., Frankford, Philadelphia
A. Barton Mfg. Co., 406 Allegheny Ave., Philadelphia
Penn Wheelbarrow Co., 494 Kansas St., Pittsburgh
Weaver Specialty Co., 634 Aurelia St., E., Pittsburgh
Geo. H. Lancaster, South Sterling
Hawes Mfg. Co., Towanda
Keystone Farm Machine Co., York

TRUNKS AND VALISES.

Craner and Sherr, 122 So. 3rd St., Philadelphia
B. Rodol, 100 N. 3rd St., Philadelphia
J. H. Seitz & Son, 414 & 433 Brown St., Philadelphia
Swab Wagon Co., Elizabethville
Swab Wagon Co., Elizabethville
Horse Handwork, Elveron
Acme Wagon Co., Enola
J. H. Young Lumber Co., Emleton
H. N. Thayer Co., Erie
W. C. Lederer, Evans City
F. M. Ott & Son, Everett
B. B. Beers, Bellinter
S. A. Mowers, Enola
Finleyville Planing Mill Co., Finleyville
Fleetwood Metal Body Co., Fleetwood
Myers Carriage Co., Middleburg
A. Reynolds, Franklin
Fredonia Bendering Works, Fredonia
M. M. Waltenby, Duncannon
M. Schultz, Gallitzin
George T. Sellers, Gap
George Rehder, Gettysburg
D. W. Bryan, Gillett
J. N. Kramer, Goodville
Stoyers Carriage Shop, Greenville
Grin & Br, Grinville
F. C. Federman, Greaves Store
McKay Carriage Co., Grove City
Scott & Kenmerrer, Hamburg
Hanover Bendering & Mfg. Co., Hanover
Hopkins Mfg. Co., Hanover
Eureka Coal Wagon Co., Harrisburg
C. G. Fair Carriage Wks., Harrisburg
C. A. Selfon Carriage Works, Harrisburg
C. E. Shaffer Est., Harrisburg
Penrose R. Co., Harrisburg
F. N. Watts, Harrisburg
Samuel Fabs, Highspire
Jas. H. Condon, Hollidaysburg
Penwarden Mfg. Co., Honesdale
Wm. Nelms, Honey Brook
Bowers & Leathers, Howard
Howard Handle & Smoke Co., Howard
Chas. E. Fletcher, Howard
M. Gillis, Hughesville
Conner Vehicle Co., Indiana
John F. Klein, Irionbridge
T. H. Haslett Lbr. Co., Jeannette
C. H. Decker, Jersey Shore

VEHICLES AND VEHICLE PARTS.

International Motor Co., Allentown
Est. of W. Wolf, Allentown
Lewis Wolf’s Sons, Allentown
Baker Tool Co., Allentown
Russell Delorder, Altoona
Penn R. R. Co. (Pennsville), Altoona
Penn R. R. Car Shops, Altoona
J. L. Sayler & Son, Altoona
T. M. Werner, Allentown
The Autocar Co., Ardmore
L. C. Bremer, Bakersfield
W. Ira Baker, Bakersville
W. G. Sterling, Bakersfield
Joseph Litterhouse, Bally
S. S. Lynch, Bausman
Jacob F. Schmitt, Beaver Meadows
J. O. Klenger, Beaver Springs
Bedford Planing Mill Co., Bedford
F. H. Brightbill, Bedford
A. G. Brightbill & Son, Bedford
W. S. Fletcher, Bedford
Isaac K. Meyer, Conklin
H. J. Horton & Co., Belleville
S. F. Appledan, Benton
Long Wagon Co., Benton
Wm. E. Grauber, Bernville R. D.
Gruber Wagon Works, Bernville R. D.
Tresscot Tool Co., Bernville
A. K. Huntzinger, Blainport
Edw. Stevens, Bowmanville
Beyertown Carriage Co., Beyertown
Pittsburgh Machine Tool Co., Braddock
C. A. Adams, Bridgeport R. D.
Chas. B. Sosson Co., Bridgeville
Standard Cast Iron Pipe & Foundry Co., Bristol
J. J. McFarland, Brockwayville
Brockville Mfg. Co., Brockville
C. W. Scott Co., Bryn Mawr
A. C. Forgie, Carbondale
H. J. & A. W. Krummacker, Carrolltown
A. C. Kelly, Center Morich
J. G. Rober, Center Co.
C. H. Schnitz, Center Valley
Walton Lumber Co., Charlestown
M. Deitcher, Chester
S. M. Conmet, Chester Heights
Schaller Bros., Clark
Clearfield Novelty Works, Clearfield
R. H. Grater, Collegeville
Frank J. Bower, Collomsville
Columbia Wagon Co., Columbia
Cornish Mfg. Co., Coonopin
F. E. Noffe, Connersport
Z. H. Markley, Conover
John G. Stoll, Decodate

J. K. Hinkle, Dillsburg
Huston Irwin Mfg. Co., Du Bois
Hobson & Co., Easton
J. Moore Young, Easton
St. Francis Industrial School, Edington
C. Proaty & Co., Eldred
C. Bailey & Co., Ephrata
A. Buch’s Sons Co., Elizabethport
Martin & Hengy Mfg. Co., Elizabethport
Swab Carriage Co., Elizabethville
Swab Wagon Co., Elizabethville
Horace Handwork, Elveron
Acme Wagon Co., Enola
J. H. Young Lumber Co., Emleton
H. N. Thayer Co., Erie
W. C. Lederer, Evans City
F. M. Ott & Son, Everett
B. B. Beers, Fallentiber
S. A. Mowers, Enola
Finleyville Planing Mill Co., Finleyville
Fleetwood Metal Body Co., Fleetwood
Myers Carriage Co., Franklin
A. Reynolds, Franklin
Fredonia Bendering Works, Fredonia
M. M. Waltenby, Duncannon
M. Schultz, Gallitzin
George T. Sellers, Gap
George Rehder, Gettysburg
D. W. Bryan, Gillett
J. N. Kramer, Goodville
Stoyers Carriage Shop, Greenville
Grin & Br, Grinville
F. C. Federman, Greaves Store
McKay Carriage Co., Grove City
Scott & Kenmerrer, Hamburg
Hanover Bendering & Mfg. Co., Hanover
Hopkins Mfg. Co., Hanover
Eureka Coal Wagon Co., Harrisburg
C. G. Fair Carriage Wks., Harrisburg
C. A. Selfon Carriage Works, Harrisburg
C. E. Shaffer Est., Harrisburg
Penrose R. Co., Harrisburg
F. N. Watts, Harrisburg
Samuel Fabs, Highspire
Jas. H. Condon, Hollidaysburg
Penwarden Mfg. Co., Honesdale
Wm. Nelms, Honey Brook
Bowers & Leathers, Howard
Howard Handle & Smoke Co., Howard
Chas. E. Fletcher, Howard
M. Gillis, Hughesville
Conner Vehicle Co., Indiana
John F. Klein, Irionbridge
T. H. Haslett Lbr. Co., Jeannette
C. H. Decker, Jersey Shore
Chas. Shoup, Jersey Shore
Conemaugh Lbr. Co., Johnstown
Joseph Landmark & Co., Jordan
American Road Machine Co., Kennett Square
Jacob & Colley Wilkes-Barre, Kingston Br. 3rd P.O.
H. W. Miller, Kittanning
H. Shaffer Lumber Co., Kittanning
E. R. Kornegay, Kittanning
R. Miller's Sons, Kutztown
Edwin A. Raper, Kutztown
J. H. Kirk & Co., Kutztown
Roy M. Rank, Lampeter
Samuel E. Bailey, Lancaster
Edwin Edgerly, Lancaster
Michael Heoer, Lancaster
Still Bros., Lancaster
S. M. Sken, Lancaster
John R. Cooper, Landsenberg
Arms & Appliance Co., Lansdowne
Lattrobe Carriage Co., Lattrobe
Monyar Carriage Co., Latrobe
The Halley & Orris Mfg. Co., Mechanicsburg
J. H. Hinkel, Mechanicsburg
J. B. Koller & Co., Mechanicsburg
Fred Seidel Estate, Mechanicsburg
Sedel & Hinkel, Mechanicsburg
Horse Carriage Co., Millinburg
Millinburg Body & Gear Co., Millinburg
D. B. Monroe, Millinburg
Elmer F. Eshoo, Millinburg
Potter Wagon Works, Millinburg
Chalfant Bros., Milford
Edward Buck, Millville
John Ees & Co., Millville
Valley Machine & Turning Co., Monongahela
J. Howard Ames, Morgantown
Wm. H. Allbright, Mont Metts
Mountville Mfg. Co., Mountville
Jacob M. Ames, Neffsville
C. H. Felten, New Baltimore
Burns & Halman, New Bloomfield
B. S. Strunkman, New Buena Vista
Shenango Lumber Co., New Castle
H. A. Buffumoyer, New Franklin
Griff & Weaver, New Holland
Wm. Hunley, New Milford
C. H. Mathews, Newville
Clarence Randell, Newtown
McGowan & Henscher, Newtown
Icieare Enrison, Norton
Harry Williams & Son, Oogontz
Eagle Spoke Works, Oil City
Kramer Wagon Co., Oil City
J. W. Connor, Orangeville
S. B. Wise Sons, Orrstown
Johnson Carriage Co., Oxford
Wilson Bros., Oxford
Marts & Fisher, Paxton
Max M. Betz & Son, 1041 Frankford Ave., Philadelphia
Block Co-Cart Co., 138-48 N. American St., Philadelphia
The John Buckley Hub, Spoke & Wheel Co., 563-75 N. 2nd St., Philadelphia
J. Haynes Caffrey, 1712 Fairmount Ave., Philadelphia
Finney & Kohler, Inc., S. W. Cor. 29th & Parrish Sts., Philadelphia
Fulton Walker Co., 1931 Filbert St., Philadelphia
Geo. W. Garrett & Sons, 33rd & Lancaster Ave., Philadelphia
Hale & Kilborn Co., 18th St. & Leigh Ave., Philadelphia
Kessler Wagon Works, Inc., 537 E. Girard Ave., Philadelphia
Morris Truck & Wheel Co., 3910 S. Bancroft St., Philadelphia
Louis Deckard, 9314 Richmond St., Philadelphia
Petretz & Keyser, N. F. Cor. 24th & Locust, Philadelphia
Pennsylvania R. R. (West Phila. Shops), Philadelphia
Reed Marbaker Co., Eight St. & Girard Ave., Philadelphia
Rodenhagen's Excelsior Wagon Wks., 1437 Hutchinson St., Philadelphia
Frank Schrader, 469 W. 2nd St., Philadelphia
The Schwartz Wheel Co., Margaret St., & P. R. R., Philadelphia
Southworth Truck Co., 911-913 Ellsworth, Philadelphia
Sowmy Bros., 1234 & 2 Frankford Ave., Philadelphia
Martin H. Walrath, Broad & Cambria, Philadelphia
Wm. Wenkerbuck's Sons, 1310 Germantown Ave., Philadelphia
C. F. Ballington & Bros., Pillow
Jno. Deetsneth, 48th St., Pittsburgh
Boohe Wagon Co., 1955 Ohio St., Pittsburgh
Eagle Transfer Co., 101 Galveston Ave., Pittsburgh
Geo. J. Eisenhauer, 229 Brighton Road, Pittsburgh
H. J. Evans, 314-315 E. Reliance St., Pittsburgh
Frazier & Foltz, 2631 Smallman St., Pittsburgh
L. Glesekaup Sons & Co., 292 Penn Ave., Pittsburgh
R. J. Hayden, 4110 Liberty Ave., Pittsburgh
Wm. J. Heusel Wagon Co., 1st & Middle St, N. P. S. & Pitts., Pittsburgh
W. J. Hittner, 3092 Penn Ave., Pittsburgh
Jno. H. Hug's Sons, Basin & Weisler Sts., Ewitt Station, Pennsylvania
Lewis Kaufman, 1295 East St., Pittsburgh
Klohs Wagon Co., 2158 Forbes St., Pittsburgh
H. Lang, Wagon Carriage Co., Second Ave. & S. Clair St., Pittsburgh
W. H. Loveland & Sons, 241 42nd St., Pittsburgh
H. Linde, So. 24th & Rice, Pittsburgh
McClinton & Co., 283 Sandusky St., Pittsburgh
Metz & Meyers, 322 Penn Ave., Pittsburgh
Monongahela River Consolidated Coal & Coke Co., No. 8 Market St., Pittsburgh
Penn Wheelbarrow Co., 1434 Harrisville St., Pittsburgh
John Sauter, 414 Duquesne Way, Pittsburgh
G. A. Schnabel & Sons, 3009 Penn Ave., Pittsburgh
Frank Sismon, 851 Main St., Pittsburgh
E. J. Thomas & Co., Louisa St., Pittsburgh
H. R. Walter Lumber Co., Fayette & Manchester Ave., Pittsburgh
J. C. White, 1325 Liberty St., Pittsburgh
C. West & Co., 429 Duquesne Way, Pittsburgh
Wilkinsburg Carriage Works, 500 Penn Ave., Wilkinsburg, Pennsylvania
F. F. Childs, Pittsburg
H. N. Trittny, Pleasant Gap
H. W. Albee, Pomona
Pennsylvania R. R. Co., Pottsville
P. McKeen Harl & Son, Lindsay Sta., Punxsutawney
Punxsutawney Fdy. & Mach. Co., Punxsutawney
Anchor Bending Works, Reading
Beil's Carriage & Wagon Works, Reading
Keystone Vehicle Co., Reading
The S. G. V. Co., Reading
Wetherhold & Bros., Reading
Harvey S. Smith, Reobuck
D. J. Rumble, Red Hill
Alvin Fauth, Red Lion
Noah C. Stabler, Red Lion
J. H. & C. Dieble, Reynoldsville
Schoeck Bros., Rockwood
Levi Hackett, Rohrerstown
L. D. Fields, Rosbury
G. W. Huber, Rural Valley
Mckelvey & Peters, Rural Valley
E. C. Beckley, St. Clairsville
John Eichelberger, Scranton
Blume Wagon Works, Scranton
A. R. Gould & Sons, Scranton
Mason & Boyd & Co., Scranton
Steep Bros., Sewickley
Frank K. Morgan, Shamokin
J. M. Hoagland & Co., Sharon
E. M. Seybert, Sharonville

VEHICLES AND VEHICLE PARTS—Continued.
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John S. Pross, Warrington
Hoopes Bros. & Darlington, Inc., West Chester
Jacobs & Colley, Kingston, Wilkes-Barre
Frank L. Underwood, Luzerne, Wilkes-Barre
Wilkinsburg Carriage Works, 600 Penn. Ave.,
Pittsburgh, Wilkinsburg Br. P. O.
Loysland Planing Mill Co., Williamsport
J. L. Rush & Son, Willow Grove
Willow Grove Bending Co., Willow Grove
J. H. Barnhart, Worthington
A. R. Benton, Worthington
John F. Stephens, Woodbine R. D.
Werner & Lesher, Yorktown
W. A. Eberly Wheel Works, York
Eureka Bending & Wheel Works, York
A. B. Farquhar Co., York
Hoofer Wagon Co., York
The Martin Carriage Works, York
Ness Bros. & Co., York
Pulman Motor Car Co., York
Ervin Smith & Co., York
York Carriage Co., York
York Wagen Gear Co., York

WEIGHING APPARATUS.
The Standard Scale & Supply Co., 243 Water St., Pittsburgh

WHIPS, CANES, AND UMBRELLA STICKS.
The Harvey V. Watt Co., 1304-26 E. Venango St.,
Philadelphia
L. Schneider Co., 4701 Worth St., Frankford
L. Silverstone & Co., 1126 N. Orlando St., Philadelphi
Geo. H. Lancaster, South Sterling
Wells Whip Co., Wellsville

WOODENWARE AND NOVELTIES.
John C. Dettra & Co., Oaks
John P. Little Co., Pictou Rocks
Nathan Cohen, 1126 N. Orlando St., Philadelphia
John Grass Wood Turning Co., 222 Vine St.,
Philadelphia
J. T. Hammond & Sons, Inc., 4534 Hedge St.,
Frankford, Philadelphia
Kassell & Co., 269 Montrose St., Philadelphia
John Klett, 1205 N. 27th St., Philadelphia
Thomas Ott & Co., 1124 Washington Ave.,
Philadelphia
L. Silverstone & Co., 1126 N. Orlando, Philadelphi
Geo. H. Lancaster, South Sterling
W. S. Wilcox, Turnersville, Jamestown P. O.
Blasdel Novelty Mfg. Co., Towanda
Patterson Bros. Co., Wellsboro
H. W. White, Whites Valley
F. E. Sherman, Williamsburg
W. John Stevens, Inc., Wyncote
Keystone Farm Machine Co., York

MISCELLANEOUS.
Pennsylvania Match Co., Bellefonte, Matches
Fred Fear Match Co., Bloomsburg, Matches
Coropolis Mfg. Co., Coropolis, Signs and
Supplies
Penn. Hub & Vener Co., Laquin, Brewers’
Chips
Bernard McCurdy, Philadelphia, Flag and Tent
Poles
John Grass Wood Turning Co., Philadelphia,
Inns and Pencils
A. H. Fox Gun Co., Philadelphia, Firearms
Geo. H. Lancaster, South Sterling, Flag Poles and
Sidewalks
F. B. Sherman, Williamsburg, Firearms
ROUGH FOREST PRODUCTS.

It was pointed out on a preceding page that this study does not include the rough lumber produced by the Pennsylvania sawmills, nor the State’s output of shingles, lath, cooperage, wood distillation, veneer, pulpwood, etc. The Bureau of the Census, co-operating with the Forest Service, yearly collects statistics for these commodities and in order to make this report complete in all phases of wood consumption, the census figures have been copied from the latest bulletins, 1911-12, in so far as they relate to Pennsylvania, and are presented in tabular form in the following paragraphs.

LUMBER.

In the production of chestnut lumber, Pennsylvania is second among the states, and third in the cut of hemlock, maple, and beech. The following table shows 22 woods cut in the State in 1912, arranged according to quantity, together with the average price per M feet at the mill and the total cost.

Table a.—Production of Rough Lumber.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity cut—Pt. b. m.</th>
<th>Average price per 1,000 ft.*</th>
<th>Total price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemlock,</td>
<td>386,188,000</td>
<td>$15.41</td>
<td>$5,951,157</td>
</tr>
<tr>
<td>Oak,</td>
<td>269,478,000</td>
<td>12.53</td>
<td>4,088,913</td>
</tr>
<tr>
<td>Chestnut,</td>
<td>35,254,000</td>
<td>16.29</td>
<td>571,720</td>
</tr>
<tr>
<td>Maple,</td>
<td>81,417,000</td>
<td>16.19</td>
<td>1,321,379</td>
</tr>
<tr>
<td>White pine,</td>
<td>71,570,000</td>
<td>21.33</td>
<td>1,532,967</td>
</tr>
<tr>
<td>Beech,</td>
<td>18,665,000</td>
<td>10.54</td>
<td>190,509</td>
</tr>
<tr>
<td>Yellow pine,</td>
<td>25,547,000</td>
<td>13.57</td>
<td>340,284</td>
</tr>
<tr>
<td>Birch,</td>
<td>17,695,000</td>
<td>16.73</td>
<td>295,976</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>14,413,000</td>
<td>22.75</td>
<td>337,886</td>
</tr>
<tr>
<td>Basswood,</td>
<td>10,925,000</td>
<td>18.67</td>
<td>205,976</td>
</tr>
<tr>
<td>Ash,</td>
<td>16,339,000</td>
<td>10.53</td>
<td>201,924</td>
</tr>
<tr>
<td>Hickory,</td>
<td>9,236,000</td>
<td>21.64</td>
<td>233,840</td>
</tr>
<tr>
<td>Elm,</td>
<td>2,594,000</td>
<td>16.73</td>
<td>49,910</td>
</tr>
<tr>
<td>Walnut,</td>
<td>2,298,000</td>
<td>21.47</td>
<td>48,984</td>
</tr>
<tr>
<td>Red gum,</td>
<td>1,454,000</td>
<td>12.47</td>
<td>18,131</td>
</tr>
<tr>
<td>Cedar,</td>
<td>892,000</td>
<td>14.46</td>
<td>12,845</td>
</tr>
<tr>
<td>Sycamore,</td>
<td>575,000</td>
<td>13.87</td>
<td>7,975</td>
</tr>
<tr>
<td>Spruce,</td>
<td>362,000</td>
<td>17.30</td>
<td>5,917</td>
</tr>
<tr>
<td>Balsam fir,</td>
<td>141,000</td>
<td>13.45</td>
<td>1,892</td>
</tr>
<tr>
<td>Tupelo,</td>
<td>100,000</td>
<td>13.99</td>
<td>1,390</td>
</tr>
<tr>
<td>Larch,</td>
<td>76,000</td>
<td>13.29</td>
<td>1,010</td>
</tr>
<tr>
<td>Cottonwood,</td>
<td>46,000</td>
<td>18.12</td>
<td>824</td>
</tr>
<tr>
<td>All others,</td>
<td>6,351,000</td>
<td>18.50</td>
<td>117,494</td>
</tr>
<tr>
<td><strong>Total,</strong></td>
<td><strong>992,180,000</strong></td>
<td><strong>$17.00</strong></td>
<td><strong>$16,863,673</strong></td>
</tr>
</tbody>
</table>

*Prices supplied from information in files of the Forest Service for prices f. o. b. mill.
LATHS.

Many of the plastering laths produced in Pennsylvania are produced from sawmill waste. Large quantities are also manufactured by portable lath mills that follow the sawmill onto cut-over tracts and clear up the remaining small softwood and the soft hardwood trees, as well as utilize the cutoffs, crooked logs, tops, and other material the lumbermen left in the woods. Hemlock and white pine are the principal lath woods in Pennsylvania, although spruce, yellow poplar, cucumber, and aspen were also reported.

SHINGLES.

Chestnut, because it is a durable wood outside and cheap, is the principal shingle material in Pennsylvania. White pine, hemlock, and a few hardwoods in small amounts were the other woods to contribute to the output. In the production of shingles Pennsylvania is not one of the principal states, but compared with the quantity of wood used by the various wood-using industries of the State and especially with the home-grown material reported, it is of considerable importance. Shingles made in Pennsylvania are both split and sawed, the sawed shingle is more salable and therefore, the kind generally manufactured.

Table b.—Production of Laths and Shingles.

<table>
<thead>
<tr>
<th>Products</th>
<th>Quantity</th>
<th>Equivalent total feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laths</td>
<td>78,758,000</td>
<td>15,752,000</td>
</tr>
<tr>
<td>Shingles</td>
<td>25,387,000</td>
<td>2,506,000</td>
</tr>
</tbody>
</table>

COOPERAGE.

Table "c" reports the quantity and cost of material used in Pennsylvania for the manufacture of barrel stock, staves, and heading. Raw material for both stave and heading is usually purchased in the form of bolts but considerable sawmill waste is saved by being converted into these products. The prices given were not taken from the Census bulletin as they are not comprised in these statistics. Information concerning them was collected from cooperage plants by agents when in the field in connection with the wood-using industry investigation, and an average made of them and applied to the Census figures.

The manufacture of cooperage is an industry which rightfully comes within the scope of the wood-using industry study because both staves and heading are but knocked-down barrels and should be included the same as box shooks or other manufactured material which needs only to be assembled to be finished. However, owing to the fact that one Bureau of the Federal Government gathers these statistics, the Forest Service did not deem it expedient to seek similar information from the cooperage plants twice in the same year. Had the cooperage data been included in the foregoing report,
this industry, according to quantity consumed, would have stood fourth in the list of over 51 industries in Table 3. Thirteen woods are demanded each year for staves and heading. They are shown in the order of amounts as follows:

Table c.—Production of Cooperage Stock.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Number of staves</th>
<th>Sets of heading</th>
<th>Equivalent total quantity required ft. in.</th>
<th>Average cost per 1,000 ft.</th>
<th>Total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beech</td>
<td>78,588,000</td>
<td>2,347,000</td>
<td>85,082,700</td>
<td>$7.00</td>
<td>$595,579</td>
</tr>
<tr>
<td>Chestnut</td>
<td>46,180,000</td>
<td>3,545,000</td>
<td>71,076,522</td>
<td>$6.00</td>
<td>426,476</td>
</tr>
<tr>
<td>Maple</td>
<td>22,390,000</td>
<td>1,715,000</td>
<td>34,198,316</td>
<td>$6.00</td>
<td>203,399</td>
</tr>
<tr>
<td>Birch</td>
<td>10,287,000</td>
<td>231,000</td>
<td>10,485,756</td>
<td>$6.00</td>
<td>57,382</td>
</tr>
<tr>
<td>Pine</td>
<td>7,597,000</td>
<td>1,775,000</td>
<td>23,556,780</td>
<td>$6.00</td>
<td>161,827</td>
</tr>
<tr>
<td>Oak</td>
<td>1,972,000</td>
<td></td>
<td>1,561,824</td>
<td>$6.00</td>
<td>9,371</td>
</tr>
<tr>
<td>Red gum</td>
<td>414,000</td>
<td>71,000</td>
<td>1,077,232</td>
<td>$7.75</td>
<td>8,349</td>
</tr>
<tr>
<td>Spruce</td>
<td>390,000</td>
<td></td>
<td>558,000</td>
<td>$6.00</td>
<td>1,120</td>
</tr>
<tr>
<td>Ash</td>
<td>146,000</td>
<td>7,000</td>
<td>283,756</td>
<td>$6.00</td>
<td>1,124</td>
</tr>
<tr>
<td>Elm</td>
<td>105,000</td>
<td>5,000</td>
<td>112,356</td>
<td>$7.00</td>
<td>786</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>47,000</td>
<td>55,000</td>
<td>577,484</td>
<td>$6.50</td>
<td>3,721</td>
</tr>
<tr>
<td>Basswood</td>
<td>37,000</td>
<td>196,000</td>
<td>1,396,776</td>
<td>$7.00</td>
<td>13,357</td>
</tr>
<tr>
<td>All others</td>
<td>427,000</td>
<td></td>
<td>346,184</td>
<td>$6.15</td>
<td>2,129</td>
</tr>
<tr>
<td>Total</td>
<td>168,564,000</td>
<td>9,349,000</td>
<td>226,323,396</td>
<td>$6.65</td>
<td>$1,534,470</td>
</tr>
</tbody>
</table>

PULPWOOD.

The quantity of wood consumed for making paper pulp in Pennsylvania, according to the 1911 Census figures, amounts to over 315,000 cords. It is procured in bolt form and is equivalent to more than 158,000,000 board measure feet that is annually taken from the forests of the State. Pennsylvania is the fifth State in the consumption of wood pulp and stands next to Maine in using large quantities of mill and woods waste in this line of manufacture.

Table d.—Pulpwood Consumption.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Quantity of wood consumed</th>
<th>Equivalent total ft. b.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spruce</td>
<td>36,243</td>
<td>26,121,500</td>
</tr>
<tr>
<td>Pine</td>
<td>81,352</td>
<td>57,583,500</td>
</tr>
<tr>
<td>Beech</td>
<td>44,320</td>
<td>22,165,000</td>
</tr>
<tr>
<td>Yellow poplar</td>
<td>37,120</td>
<td>27,968,000</td>
</tr>
<tr>
<td>Hemlock</td>
<td>36,181</td>
<td>26,086,000</td>
</tr>
<tr>
<td>Maple</td>
<td>30,074</td>
<td>15,037,000</td>
</tr>
<tr>
<td>All others</td>
<td>10,285</td>
<td>5,147,000</td>
</tr>
<tr>
<td>Slab wood and other mill waste</td>
<td>54,884</td>
<td>27,197,000</td>
</tr>
<tr>
<td>Total</td>
<td>235,682</td>
<td>157,841,000</td>
</tr>
</tbody>
</table>
HARDWOOD DISTILLATION.

Beech, birch, and maple are the principal woods consumed in hardwood distillation. They have been separated in the following table merely to emphasize the kinds used and the quantities are not representative of the actual results but were arbitrarily divided in equal amounts for the want of more definite information. Besides the above named woods, oaks, hickory, chestnut, elm, and ashes were also consumed but in small quantities only. Pennsylvania hardwood distillation plants generally employ the destructive process. Charcoal, crude wood alcohol, and gray acetate are the principal products.

Table e.—Hardwood Distillation.

<table>
<thead>
<tr>
<th>Kind of Wood</th>
<th>Cord.</th>
<th>Equivalent total ft. b.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beech</td>
<td>121,513</td>
<td>60,756,500</td>
</tr>
<tr>
<td>Birch</td>
<td>121,513</td>
<td>60,756,500</td>
</tr>
<tr>
<td>Maple</td>
<td>121,513</td>
<td>60,756,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>364,539</strong></td>
<td><strong>182,289,500</strong></td>
</tr>
</tbody>
</table>

VENEEER.

Over 2,500,000 feet of logs in Pennsylvania were converted into veneer in 1911. These are not necessarily cut from the forests of the State as veneer logs are sought after over a wide territory and are imported from foreign countries and manufactured into veneer by mills in easy reach of important markets. In Pennsylvania maple was the principal wood consumed, followed by beech, yellow poplar, basswood, oak, birch, and cherry, in the order named. Spanish cedar was the only foreign wood.