Volume 2 Article 8

1-1-1914

The Manufacture of Walnut Gun Stocks in Iowa

G. B. Mac Donald
Iowa State College

The Manufacture of Walnut Gun Stocks in Iowa

G. B. Mac Donald

Professor of Forestry, Iowa State College

Few people know that an Iowa company is the largest producer of rough gun stocks in the world. The Des Moines Saw Mill Company, located at the capitol city of the State, produces annually about 1,200,000 walnut gun stocks. This number has been sold by the company during the past year. It has been variously estimated that this number equals from 50 to 75 per cent of the total yearly supply of walnut stocks in the United States. With the exception of a few manufacturers of fire arms, the Des Moines Saw Mill Company supplies all of the leading gun companies of the United States using walnut stocks. Although a large part of the blank gun stocks are further manufactured in this country, some stocks are marketed in Europe.

Although the present company has been operating only four years, Des Moines has had a walnut saw mill for the past twenty years. During this period the mill has been operated by a number of different companies. It was at the time of the Spanish-American war that the firm began to concentrate its operations on the manufacture of gun stocks. This was brought about largely through the Government's placing an order for a million blank gun stocks with the company at that time. At the present time the Des Moines Saw Mill is the only company in the United States which specializes in the manufacture of this product.

During the present year the company's cut will be one and one-half million feet, board measure. One million feet of walnut logs are now piled at the mill awaiting manufacture. This amount will supply the mill for a period of about eight months, even though the company were not adding carloads of logs daily. It is probable that only on very few occasions has this quantity of black walnut logs been assembled in one place.

Iowa grown walnut is considered as one of the best woods for gun stocks—even better than the same timber grown farther to

the south. This may possibly be accounted for because of the relatively slower growth of the tree in this region. The manufacturer considers the Iowa walnut superior to the European species used for gun stocks, in most points, except toughness—in which the European walnut excels. The color of the Iowa wood is a rich chocolate brown which is intensified by proper finishing. It has been found that the black walnut will stand much rough usage, which adds to its value for gun stocks. Because of the false impression of the superiority of European walnut, European manufactuers have imported walnut logs from the United States, re-named them, and sold the product as the European wood.

As indicated on the accompanying map, the greater part of the company's supply of logs is obtained from southern Iowa, northern Missouri, southeastern Nebraska, eastern Kansas, and small amounts from east of the Mississippi River. In a number of instances the logs are bought through jobbers who receive a percentage commission. Frequently, however, the company purchases directly from the owner of the timber. In this case a man is sent to inspect the logs, which must be piled on a suitable siding on the railroad. The purchases are made generally from farmers who are clearing land. The logs must measure twelve inches or over in diameter at the small end, but may be of any length. The logs need not be clear. The trees as a rule have a relatively short clear-length and, as a result, the proportion of knotty logs is somewhat high.

The company does not specify a price for logs until they are seen because of the great variation in size and quality. As a rule the prices range from $25 to $125 per thousand board feet. In exceptional cases this price might be below this or in the case of very high class logs a price exceeding $125 per thousand feet is occasionally paid.

Although a large part of the walnut timber in the central region has been cut, there are considerable amounts to be found on the moist lands adjoining the streams and more especially in northern Missouri. The company estimates that they will have no shortage on walnut timber for many years unless the walnut wood is used more extensively for other purposes than at present.

No attempt is made by the company to purchase logs outside of the area shown on the map. This is due to the increased

Shaded area shows region from which most of the walnut logs are obtained for the Des Moines Saw Mill Company.

freight charges to Des Moines. The rate from Kansas City to Des Moines is 11 cents per hundred pounds. The rate for average points in northern Missouri is 9½ cents. For interstate shipments, the rate on the walnut logs is the same as the through lumber rates. For intra-state shipments the rate is the same as for soft coal. A large number of the purchases of logs are in the territory of the C. B. & Q. Railroad.

Altogether the freight rates on logs are quite satisfactory, except for some dissatisfaction found in the rates on the manufactured product which is shipped to the east. It is understood that the railroads have promised an early adjustment of this difficulty.

Practically all of the logs are shipped in open coal cars—which facilitates unloading at the mill. A steel derrick, with a bearing pole 100 feet in height, operated by steam and cable, is used for unloading. The logs are piled to a height of 60 or 70 feet.

Because of the greater ease in working freshly cut timber the logs are sawed as soon as they reach the mill, unless the receipts are in excess of the cut, which is the case at present.

Before sawing most of the logs are barked by axe, in order to protect the saw from grit. This is done on the rollway. The ordinary double circular saw is used, cutting from above as well as below when large logs are encountered. Before being gummed, the saws measure 54 inches and cut a kerf of about 3-16 of an inch. Since practically all of the boards are thick the loss in kerf is not excessive. The saw carriage is cable driven and the power for the saw and carriage is supplied by a 50-horse power motor.

The standard gun stocks are manufactured from blanks two inches in thickness. Foreign governments, with the exception of Japan, call for stock 2¼ inches thick and the United States Government uses stock 2⅜ to 2½ inches in thickness.

Cants are sawed, in thickness depending upon the orders being filled, which are carried forward on rolls and loaded on trucks operated on rails. The truck loads of cants are taken to the second floor by hydraulic elevator where the trucks are rolled to the pattern marker's benches. The markers outline in pencil around the thin wooden patterns. The marking must be done so as to obtain the proper run of grain in the stock and at the

same time the cuts must be made so as to utilize the material as fully as possible. The pattern markers mean the making or loosing of a considerable amount of money. It is generally possible to use a number of patterns of different shapes at the same time. This makes possible a closer utilization of material. At the present time the company is manufacturing blank gun stocks from about twenty-five different patterns. Most of the stocks are of the short type but some must be long enough to allow for the forearm or grip which is found beneath the barrel in some types of guns. In all cases the patterns allow ample material for proper trimming and dressing down for the finished product.

The marked cants are next conveyed to the band saws where the blank stocks are sawed out. Two of the three band saws on the upper floor of the mill are generally used for sawing out the blanks. The third saw is used for sawing other material. Each band saw is operated by two men—a sawyer and helper—and each saw has a capacity of about 200 blank stocks per hour. A set of gravity live rolls transports the blank stock to a chute which delivers the pieces to the kiln. A system of switches in the chute diverts the blocks to the particular kiln which is being filled.

Four steam kilns are kept in operation, each wtih a capacity of about one-half a car. The blank stocks are piled carefully, on edge, in the kiln, from the floor to the ceiling, with no particular attention paid to leaving spaces between the pieces. Steam is admitted to the kiln from small holes bored in pipes which are laid in the floor. A temperature of about 175 to 200 degrees F. is maintained continuously for 96 hours. A circulation of the steam is made possible by two vents—one in each end of the roof of the kiln. The kiln process has two distinct advantages. In the first place it reduces the freight charges by 20 per cent by reducing the weight. Another advantage is gained by the darkening of the sap streaks, in the cheaper grades of material, during the steaming process.

After the required time in the kiln the stocks are carried, or run on a gravity live roll, from the kiln. The unloading is accomplished from the opposite end of the kiln from which it was loaded. This lessens the distance for conveying the product.

The next step in the process consists in dipping both ends of

the gun stocks in warmed parafine to the depth of about one-half an inch. A small vat about two feet long is used and each piece is dipped separately. This, of course, is for the purpose of preventing checking. The dipper man places the parafined blocks on brackets which are attached to an endless chain, operating in a vertical position. This chain conveyer carries the stocks to the distributing tower where the product is inspected, sorted and distributed by chutes to the various bins where the material air seasons for a varying length of time. A buffer or padded "back stop", hinged at the upper end, is placed at the lower end of each chute to prevent the stocks from becoming unnecessarily jammed when they fall into the bins. The walls of the bins are constructed corn crib fashion in order to permit a good circulation of air. Shipments are generally made in car lots.

With certain brands a distinction is made between the ordinary stocks and selects or highly figured pieces. The wavy or curly grained sticks are use in high class firearms. Although more expensive, this selected stock is more difficult to finish because of the chipping up of the wavy or curly grain under the tool.

Throughout the mill there is a very close utilization of material. The slabs are cut into cants as they come from the saw and worked into pieces varying in size from 1½x1½x6 inches to 1½x1½x21 inches. The former or smaller pieces are eventually made into the forearms or slide arms for repeating rifles, and the latter into billiard cue handles. Several intermediate sizes of material are also cut from the slabs. For this work a band saw and small circular cut-off saw, located on the ground floor of the mill, are used, two men working at the former and one at the latter machine. The edgings, unusable slabs, ends and defective pieces are loaded directly into coal cars and sold to two of the local railroad companies. There is a good demand for this waste material from the railroads. It is used for starting fires in the locomotives. The sawdust finds a ready market as a packing for ice. Because of the greater durability of walnut sawdust, it is considered superior to some of the other species for this purpose.

The mill also cuts some walnut pieces to be used for steering wheels of automobiles. These sticks measure 1¾x1¾x60 or 65½ inches. Only the very best grade of material can be used for this purpose. The wood must be very straight grained and almost

absolutely free from defects in order to make possible the bending of the sticks into a circular shape.

Only a very small amount of the walnut is sawed into lumber, and this is only to accommodate small purchasers. Occasionally some of the walnut timber is shipped in log form to Europe, principally to Hamburg, Rotterdam, and Amsterdam. This is generally high class material which is nicely figured.

Although the company deals almost exclusively in walnut, it cuts annually on an average of about 125 thousand feet of other hardwood species. Oak logs are purchased for from $15 to $23 per thousand feet net to the seller, and cottonwood nets the original owner of the logs $12 to $15. Other species which are cut to some extent are elm, ash, hackberry, basswood, soft maple and hickory. All of these except basswood, soft maple and cottonwood are cut into special dimension material for use in the city. The basswood, soft maple and cottonwood are mostly cut into 1 inch material and used for cabinet backs, shelving, etc. The average selling price for the lumber, other than walnut, is $40 per thousand board feet.

The mill operates 300 days in the year and 9 hours per day. Although the maximum capacity of the mill is small—about 10,000 feet board measure per day—the utilization is close and the products require handling a number of times, consequently a comparatively large mill crew is required. Thirty-five men make up a full crew and they are apportioned as follows:

Two Superintendents.
Three men with the unloading derrick.
Six men at the circular saw.
Eight men at the small band saws.
Two men at circular cut-off saws.
Five pattern markers.
Four kiln men.
Two saw filers.
Three roustabouts.

The wages paid run from $1.50 per day up. About 25 per cent of the labor is negro.

Each saw and machine is operated by a separate motor which adds materially to the efficiency of the plant. The electric power is purchased from the city.

Under ordinary conditions, about 90 days elapse between the

A walnut log after barking, ready to be rolled onto the saw carriage.

A pile of 1,000,000 feet of black walnut logs in the yards of the Des Moines Saw Mill Company

Unloading derrick at the plant of the Des Moines Saw Mill Company.

The sorting tower where stocks are inspected and distributed by chutes to the storage bins.

time the logs are purchased and the time the product is marketed. Occasionally requests are received for gun stocks which have been air seasoned for a greater or less period after cutting. In some cases the period specified is five years, but the company does not receive such orders inasmuch as the price of the product would be greatly increased, due to the interest on invested money and insurance on the stock itself.

The operation of the Des Moines Saw Mill Company is unique in that the mill occurs in a region where little timber is being cut, and also because of the class and quantity of the product which they produce.