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WHEN WE PLANT THE TREE.

WHAT do we plant when we plant the tree?
We plant the ships which cross the sea;
We plant the mast to carry the sails;
We plant the planks to withstand the gales—
The keel, the keelson and beam and knee;
We plant the ship when we plant the tree
What do we plant when we plant the tree?
We plant the houses for you and me,
We plant the rafters, the shingles, the floors,
We plant the studding, the lath, the doors,
The beams, the siding, all parts that be;
We plant the house when we plant the tree.
What do we do when we plant the tree?
A thousand things that we daily see;
We plant the spire that out-towers the crag,
We plant the staff for our country's flag,
We plant the shade, from the hot sun free;
We plant all these when we plant the tree.

SAW MILL BUILDING.

BY J. H. MINER.

ARRANGING a mill to cut 10,000 feet in ten hours, with seven hands, including piling of lumber and arranging bill stuff, may sound a "little off" to those who are employing twice that number of men.

First, it is best to set the mill with end to a hillside and receive the logs on a car. This is best where bills are cut on short notice, as logs can be received from both sides of the track.

If logs are to be sawed as they come, they may be received more conveniently from the side. In this case it is much better to build an overhung roof, so that all in front of the carriage will be clear. The logs should be dropped as closely to the mill as possible, to save much rolling.

The carriage I have partly described. What is wanted is a cheap, quick and reliable overhead turner. The cost of machinery, of course, must be carefully compared with labor. Fifty dollars will put up a log turner which fifty days running will pay for in the saving of the man, to say nothing of the increase in cut. A great drawback in small mills is not having a log-turner; to get the same results requires two, sometimes three extra men.

To construct the log-turner, put a 36x8 inch friction pulley on a three inch shaft four feet long. This shaft is set, say three to six inches over the end of the head-blocks. Next a two-inch shaft with 8x8 paper or wood friction pulley on the outer end, working in a sliding box. This shaft extends back over the saw mandrel, where power is taken. The feed shaft should be reduced about one-third. Use not smaller than twenty-inch pulley on saw mandrel, or larger if the logs are heavy. If the feed rig interferes with putting the pulleys in right, increase the size or diminish the pulleys. The belt being a quarter-twist, will necessitate the driven pulley being larger to get farther from the saw. Few sawmills are constructed so that a turner of this kind cannot be used.

The question of the chain comes next, but not in a tricky intermediate friction. On the end of the three-inch chain shaft a wood spool, say eight to twelve inches diameter, is placed; around this is wound a rope with a heavy weight attached to hang out of the way. The lever that handles the friction is arranged with a brake working on the face of the large iron pulley. The sawyer pulls his lever gently, unwinding the chain as desired which is done while sawing. The chain remains just where left. This constitutes the best and most reliable rig out. It cannot get out of order and is quick.

The sawyer, setter and one man to roll down logs constitutes the saw crew. The log-deck man handles the chain while setter attends to releasing the dogs.

While log is being sawed up he is rolling down or bringing in logs on a car. The sawyer stands behind the saw to down the boards (which is the proper place for him.)

The first five or six rollers are made live by simply attaching a sprocket wheel on the end of roller shaft, which should not be less than one inch, and must extend through the roller, which must not be less than ten or eight inches in diameter, as the sprocket wheel must be two inches smaller, to allow an inch board to protect the operators. The first roll is driven with a three-inch belt from the saw mandrel. The link belting or chain drives the rolls by simply passing over the top of the sprockets, except the first and last. Rollers may be made of dry hardwood with a key pin through the center, or they will soon become loose and worthless. A rig of this kind will cost but \$30 above the ordinary rig, and give thirty to forty feet of live rolls, as desired.

The space between car track and rolls should be about thirty inch. The siding can be placed on skids beyond the track and edged on main saw when in the way. The swing saw should be five feet ahead of the longest log that can be cut. Two men behind the sawyer will place the lumber, the bill stuff being dumped on skids beyond the swing saw and stock lumber taken to destination on car or lumber truck.

A word here about lumber cars. Few of them are labor savers. They are constructed very small, heavy wheels, running on rough bearings in wood at that. I have seen many such cars require two good men to get back in the mill. The wheels should be large and light running in babbitted boxes, with a frame just heavy enough to keep the car square on an iron track.

One man with two cars can take care of 15,000 feet of lumber. One man can do the piling, which will be about one-half the mill cut where bills are cut, otherwise two men will be required. Then a boy to fire and all goes along well. The slabs are cut into four-foot lengths, as most suitable for lath. The surplus may be kept away with a cart or carried out on a separate dumping car to a place out of the way, where most of edge trimmings must go.

While edging up, the log deck man assists in placing siding on carriage, the sawyer and setter placing it. The sawyer will have ample time at noon or evenings to attend to machinery. By using a good inserted tooth saw a few moments "pointing up" will be all that is required of him, while the setter can change teeth when necessary.

I recently saw a letter from a reputable firm which is cutting 50,000 feet per day of yellow pine with an inserted-tooth saw, using "shot-gun" feed. They would not have a solid saw. This is an exception, but it is not impossible with the right style of saw.

FORESTS AND DESTRUCTIVE INSECTS.

THERE can be little doubt but that insect pests as a general rule attack only those trees which have been debilitated and weakened, of which state some of them are good judges. As a remarkable instance of the instinct shown by an insect, it may be mentioned that the writer, when exploring timber land on the Nashua river, in New Brunswick, having to camp in the woods, built his fire against a large spruce, which he used as a back log. The ground was covered with moss, and the roots exposed. On them the fire was laid. The tree when left next morning was badly scorched. Two or three days after, on returning to this place, the borer was seen hard at work depositing her eggs in the doomed tree.

At Somerville, lecturer on Forestry, Edinburgh University, says: "The most common cause of the production of a large quantity of breeding material is

a severe gale, or a succession of severe gales, such as we experienced in Scotland some years ago. At that time, as will be remembered, whole woods were leveled with the ground over wide areas of country, and for some years afterwards the timber could neither be cut up nor marketed. That, then, was an opportunity for *Hylurgus piniperda*, as well as for all bark beetles, to increase at a prodigious rate, and one which the results show that they were not slow to avail themselves of."

Precisely the same thing has occurred in New Brunswick, where, after a heavy gale, by which large extents of forest were blown down, great destruction was made among the standing trees by bark beetles, so much so that on one brow among 100 spruce logs but 10 were found to have been cut from living trees, the other 90 having been destroyed by beetles. The forests which suffered most after the gale referred to, which is locally known as the "Saxby," were those consisting of large trees which had been cut among. Where lumbering had been carried on for some time and the larger trees cut away, little harm was done by the beetle, due no doubt as well to the circumstance that the trees in the latter instance were not so tall, and consequently not so obnoxious to the effects of the gale, as to the fact that as there were fewer trees standing on the same area of ground, they would be better supplied with sustenance from it than the original forest would have been had it remained intact, and thus the tree which had been cut among were endowed with sufficient vitality to resist the insects' attack.

Spruce woods gain much by being cut among and the larger trees removed, since the danger of attacks from insect is thereby lessened, and light and air being more freely admitted, the growth of the remaining trees is greatly facilitated thereby. EDWARD JACK.

Fredericton, N. B.

THE MANUFACTURE OF SPOOLS.

AS MAY well be imagined, the immense number of spools used and thrown away every year requires that the business of making them should be conducted on a large scale, and with facilities for rapid production. Birch wood is preferred. The wood is first sawed into sticks of four or five feet long and seven eighths of an inch to three inches square according to the size of the spool to be produced. These sticks are thoroughly seasoned. They are sawed into short blocks and dried in a hot air kiln. At the time they are sawed, holes are bored perpendicularly through each block which is set on end under a rapidly revolving, long-shanked auger. Next, one whirl of each little block against some little knives that are turning at lightning speed, fashions it into a spool according to the pattern desired, and that, too, at the rate of one second for each set of knives. A row of small boys feed the spool making machines by simply placing the blocks in a spout, selecting the best and throwing out the nobby and defective stock. The machine is automatic but there are some things which it cannot do, hence the employment of the small boys above mentioned. After the spools are turned they are placed in a large drum and revolved rapidly until they have taken on a fine polish. For some special purposes they are dyed yellow, black or red, according to taste. When one sees a spool of thread marked "200" or "300 yards," it does not signify that the thread has been measured, but that the spool has been gauged, and is supposed to have that amount of thread upon it.

The Interior Department at Washington has ordered a permanent government post to be established on the Rainy river, near Fort Francis, 150 miles north-west of Duluth, for the purpose of watching timber stealers from Canada.