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DEFECTIVE MILL CONSTRUCTION AND OPERATION.

IN my rounds, says J. H. Miner in The Woodworker, I find very few sawmills profitably constructed and arranged, though the aim was to have a perfect mill. I do not allude to novices in the business, but men of money and experience make these mistakes. Later they see and admit it, and if they build again these mistakes are not repeated, but even then broad mistakes are often made.

A man of experience and money built his third mill lately, and invited me up to see it, and I took occasion to visit the place. It was a fine mill—fire-proof boiler house and all the modern improvements. The mill was running nicely. My attention was first directed to the arrangement of steam pipe of main engine, an eight-inch pipe, which had a leaky expansion joint which could have been done away with in that length of pipe by connecting it right to the engine without the extra elbow. The engine was running rather slowly. Further investigation found a hot saw mandrel. Nothing would keep it cool. I found a 28-inch pulley on mandrel and a tight 20-inch belt on it. Right here was the cause. Had there been a 36-inch pulley on mandrel, the 20-inch belt would have run with 50 per cent. less tension to do the work.

The edger was set so close to saw that there was time lost in sawing long lengths. I made no further investigation, but saw a deficiency of 10,000 feet in the mill. I said the mill ran nicely; so it did, but to crowd the saw to what it should stand, the drive belt would slip, and to make it tighter would burn out the boxes. Sixty-inch 6-gage saws, 80 teeth, were used, and would stand right up to 12-inch feed in 12-inch cut, if the belt would hold it. The proprietor didn't seem to want over 45,000 out of the mill when it would have cut much more. A little defect to look at, and 10,000 feet short every day of the capacity of the mill.

In another mill a centre-crank engine was put in. The shaft was all on one side of the crank and only a bearing on the other side. An eight-inch shaft, full of pulleys, with a 3½ inch bearing on a disk crank pin. The result was a slight pound, and the chances of a hot wrist. Here "nursing" was unnecessary. The engine might have suited for another class of work, but the man got the wrong thing when he placed that style of engine for sawmilll work.

In a large cypress mill, 60-inch bottom and 48-inch top saws were run instead of 72-inch bottom saw and 36-inch top saw. As no two saws can be made to track accurately, as large a lower saw as possible should be run. In this mill, and I venture to say in nine-tenths of all mills, the top saw ran in the direction of the lower, and in deep cuts bad lines were made and valuable lumber spoiled. The mill man saw it, but after his mill was put in and a stock of saws on hand. He was familiar with smaller timber and made a "little oversight" in ordering his saws.

A prominent mill firm with a paid-up-capital of $150,000, concluded its main engine had too much to do. Another engine was bought and placed, without "thinking" that the steam would be affected, as there was ample and a surplus. Result, no steam one-half the time. The engine was finally taken out. The president overruled the superintendent's views and had the engine put in.

A great mistake is often made in the power. A surplus should be put in, as progressive mill men are generally adding instead of diminishing. Small shafting and light belting is a great drain on many mills. Sawmill machinery has more breaks downs and delays than any other class of machinery. This is casting no reflection on the foreman, who is often on the lookout, expecting what he cannot overcome. The foreman often gets no credit for what he foresees and claims ought to be done. A three-inch shaft was in use in a certain place. Nothing was thought about it until, in the midst of a rush, it gave way. The foreman insisted on a steel shaft, but it was not heeded; but it was put in later, after the second shaft was broken. In a change of line shafting a wood pulley 16 x 48 was put on. The pulley man and the superintendent overruled the foreman, who remarked that one month was the limit—and so it was. With the superintendent's careful watching that it was kept tight, it played out in five weeks.

The foreman is often criticised for "knowing it all" when he expresses a weakness of certain parts. There is a great difference between the man who takes the mill as it is, and makes out with what he finds there, and takes care of it though he knows what is weak, and the man who wants this, that and the other taken out because it doesn't suit his liking, when in reality it is a better machine or part than what is replaced.

The construction of the furnace and size and height of stack have much to do with the steaming qualities of sawmill boilers. It is not the size of the boiler that makes steam, but the furnace and stack with draft to burn lots of fuel, which in turn makes plenty of steam. It is astonishing the amount of money spent in experimenting in changing a mill. We note mills built to cut a certain amount, which, when completed, lack considerable of coming up to it; but after months of running, involving many changes and loss of thousands of dollars, the mill attains its capacity. Why cannot men of money and experience put up a mill that will at the start turn out what it was built for? In some cases mills are constructed and proportioned right, and from the start turn out their intended capacity. Such mills make money. A mill properly constructed throughout should run every day through a season, without loss of any time whatever from machinery or belting.

HEMLOCK FOR FLOORING.

A RECENT issue of the Pacific Builder contained the following interesting information and general comment on this subject: "The floor of the Clatsop county court house at Astoria, Oregon, is of native hemlock and was laid over thirty years ago. It is now in good condition, it is stated, although it has been subject to the severest usage. This is one of the best illustrations of the high value of native hemlock and demonstrates the superiority over the eastern species of the same tree. In our large buildings one of the most difficult features to obtain is satisfactory flooring. In the Oregon building according to specifications no joints were to have been made in the flooring in any of the offices. In consequence continuous lengths of twenty feet and upwards were sometimes required, which in hard flooring is almost impossible to obtain—at least without a very great expense. None of our native hardwoods could well be made to meet the requirements of such specifications. Whether or not eastern maple could have been obtained of the desired length and perfectly clear, was not demonstrated, for, as a matter of fact shorter lengths were used in the floors than were at first specified. Still in fine buildings unbroken floors are very desirable, and are much more enduring. If it should be found, therefore, on further experiment, that native hemlock will make a smooth, close and durable floor, the fact will generally be hailed with delight by our builders. It should not be forgotten that this wood has never yet been fully tested on this coast, but so far as it has been tested the results would appear to be quite satisfactory. It exists in abundance throughout Oregon and Washington and the timber attains a great size here everywhere. No difficulty would be experienced in obtaining flooring in any desired length from hemlock."

Hemlock is, as almost everyone knows, found also in great abundance in British Columbia, but it is in the opinion of leading lumbermen unlikely that much use will be made of the wood for flooring for many years to come. The hemlock, though otherwise durable, is somewhat apt to splinter on the surface with wear, being in this, as in certain other respects, inferior to cedar or fir, the supplies of which last woods are in British Columbia inexhaustible for generations to come. It is, however, possible that a modest use of native hemlock will gradually come to be made by B. C. lumbermen.

NEW ZEALAND LUMBER INDUSTRY.

THE timbers of New Zealand, says a writer in The Northwestern Lumberman, are as numerous as they are varied and beautiful, but those that have up to the present been brought into any commercial use consists of kauri, rimu (red pine), mattai, kahikatea (white pine), totara, silver pine and black birch; the first of these, the kauri (Damara Australis) is the well known New Zealand pine, and its production and general commercial use has far exceeded in quantity any of the others as it excels them in value and superiority. History says that Capt. Cook, the great navigator, first discovered its merits, landing and obtaining kauri spars for refitting his vessels on the first voyage of discovery. The timber is light in color and regular, with the grain displaying fine, even markings. Kauri is only excelled by our southern pine. It is more silky than Quebec yellow pine, and takes a higher finish. It is stronger and more durable than the best red deal of the White Sea and Baltic. It is tougher and more elastic than American spruce, while it is more easily worked than the redwood of California. Boards of it can be obtained in long lengths and up to six feet wide without a knot or shake, and it may safely be stated that no other timber known is capable of being applied to such varied uses. Houses in New Zealand and Australia are constructed of it throughout from the shingles to the floor, internal work being left varnished to show its fine figure. It is also used extensively for railroad sleepers, bridges and wharf construction, and railroad cars, and is especially adapted for masts and deck planking of ships, many vessels being entirely built of it. It planes across the end of the grain as smoothly as with it, stains well and takes a high polish, being much in demand for church and counter fittings on this account. Its durability is unquestioned. Some of the early wooden houses built in Auckland fifty years ago of heart kauri are standing now, and the timber shows not the slightest signs of decay. Street blocks laid eight years ago on the Auckland wharves present few signs of wear. The kauri is indigenous to New Zealand and grows only on the province of Auckland between the 38th degree latitude south, and the north cape. It is the monarch of the New Zealand forest, in dimensions falling very little short of the giant sequoias of the northwest, many of the trunks rising to the height of 120 feet before the branches are thrown out. The tree is invariably found in clusters in dense bush and in mountainous country, this fact adding materially to the difficulty and cost of production. The tree is of phenomenally slow growth and has attained an immense age before it is felled. The rings on some of the large trees number over 1,000. To the credit of New Zealanders be it said, that these patriarchs are generally spared for the benefit of future generations.

HOW TO DO IT.

THE hardness of steel tools may be much increased by making them white hot, dipping them repeatedly into sealing wax until cold, and finally touching them with oil of turpentine.