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WOOD WORKERS' MANUFACTURERS' AND MILLERS' GAZETTE

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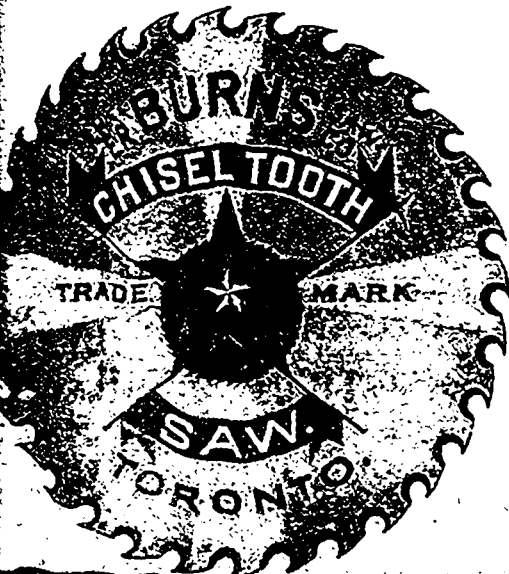
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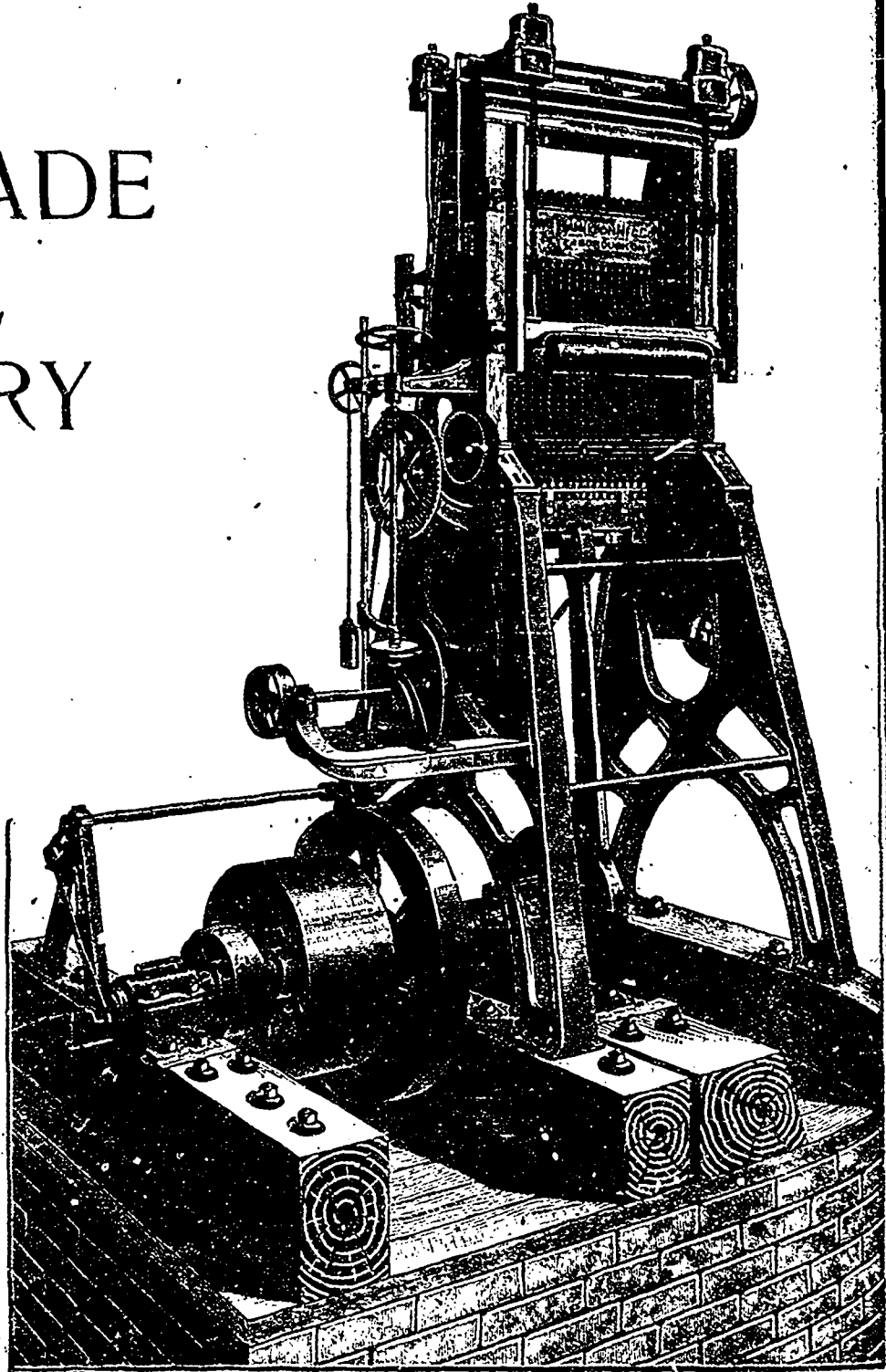
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Yours very truly, JAMES MCKINLAY.

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Yours truly, KILGOUR SHIVES.

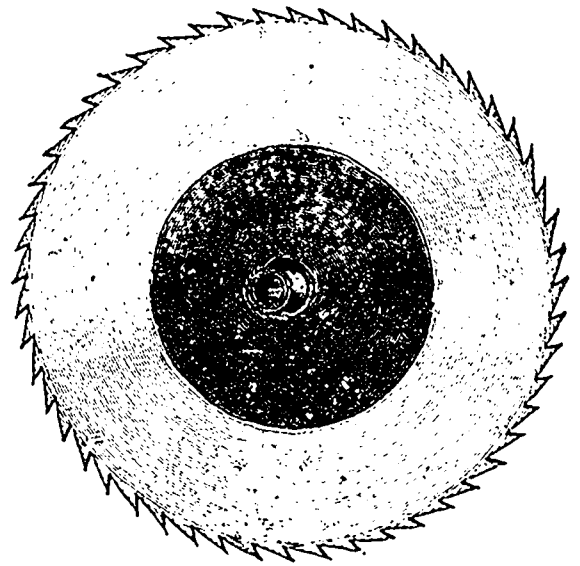
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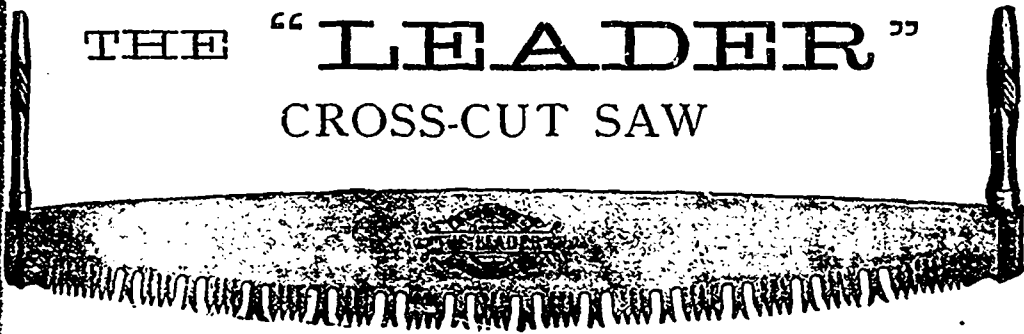
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Yours truly, W. G. SIMMIE.

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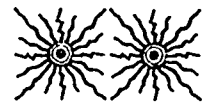
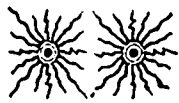
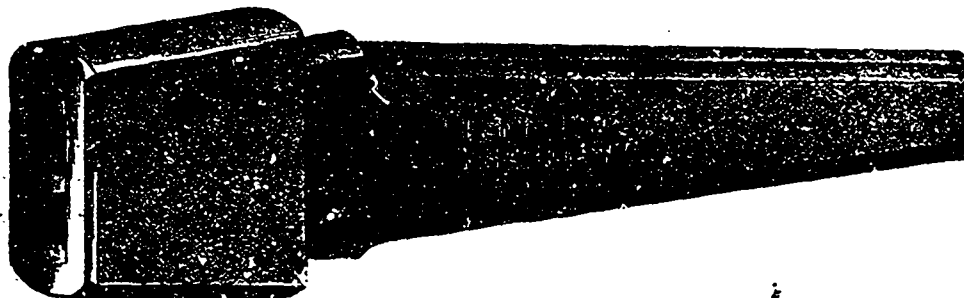


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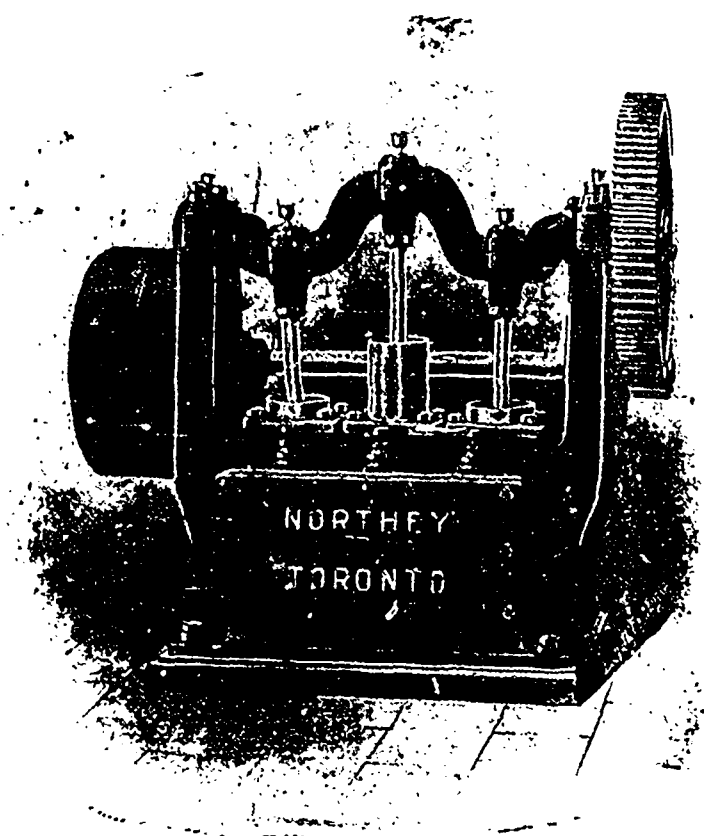
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MODERN METHOD OF BREAKING A LOG JAM.

THE accompanying illustration shows, in operation, a contrivance arranged by Mr. Samuel Bingham, of Ottawa, for the speedy loosening of a jam or other accumulation of logs, pulpwood, ties and so forth. Mr. Bingham is probably one of the best known and most successful logging contractors in Canada, having charge of all the logs on the Gatineau river for a distance of 100 miles, from the river Desert to Ottawa.

The view shows an accumulation of 250,000 logs and an equal number of pieces of pulpwood and ties. The "tie up" is located at the retaining boom on the Gatineau, situated at the Cascades. The logs are piled a distance of half a mile and to a height of 28 to 30 feet, extending the entire width of the river, about three-quarters of a mile. A sudden rise of water in the tributaries caused the accumulation of logs. In 10 days last spring over 500,000 pieces were swept in from a distance of 60 miles up stream. The current in the Gatineau on this stretch runs 20 miles an hour, and as the logs were swept down to the collection at the boom, they were forced under water, and thus coming to the surface under the other logs, raised the entire lot to a great height. The logs presented an unbroken

front, and hence were even more difficult to handle than when in the shape of a jam. Under ordinary circumstances, months, and perhaps an entire season, would have elapsed before the logs could have been released and sent on to the different mills. Mr. Bingham, however, decided to put into operation a scheme that suggested itself to him last season. He secured a 60 horse power steam hoist and placed it on a platform 120 feet long and 36 feet wide. From this hoist a three-quarter inch steel cable was worked over a drum 27½ inches in diameter. The cable was 550 feet in length, and a second one was provided for cases of emergency. A number of ordinary jam dogs or hooks, single and double, were provided, as well as log tongs. When it was decided to release the logs, the tongs were first used on single logs, a number of which were taken out to make channels. The tongs, of course, were fastened to the cable, which was operated by means of the steam hoist over the drum. After the necessary channels had been cleared, the dogs and hooks were brought into play. The latter were so placed

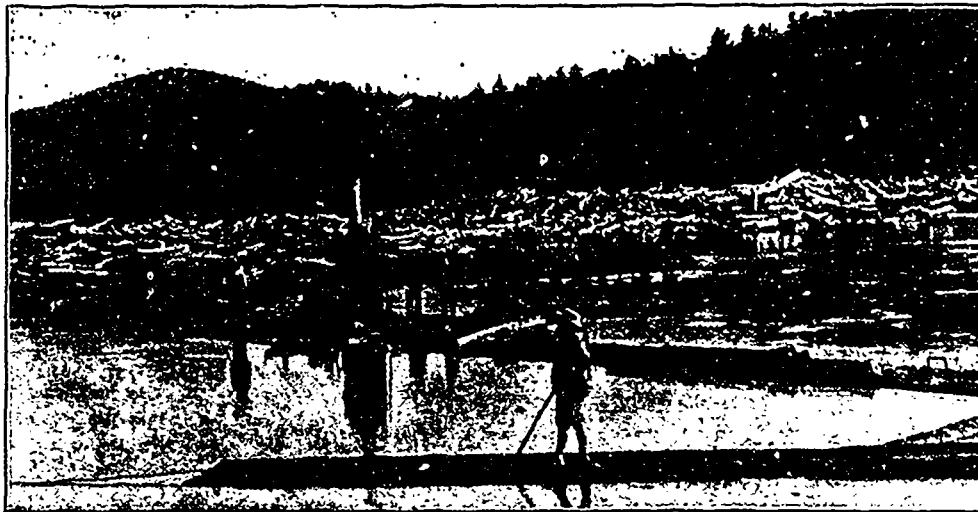
that the release of one log brought thousands with it. Thus in the operations pictured, as many as 5,000 and 10,000 were brought out at a time. The use of the tongs in the first instance gave a more direct purchase on the single logs it was desirable to release. The engineer can regulate the strength and speed of the pull as demanded by the position of the logs, number of logs to be released, etc. The contrivance is, in short, to the log stream what the reaper is to the wheat field. The latter, when compared to the sickle, does not do one-tenth the work Mr. Bingham's contrivance accomplishes. Its advantages are manifold; speed and safety to the men are important factors in its workings.

The float with the hoist can be so placed that when the logs are released it can be readily swung clear of danger. Another advantage it

wood ever brought together on the Gatineau, and it was held back by one of the strongest booms in the world. At this point there are four piers stretching across the river. The largest one in the center, is 100 feet square at the base and tapers to a crown 46 feet square. It is 96 feet high. These were built by Gilmour & Co., under the direction of Mr. Bingham. Owing to the frequent change in the level of the water most of the other booms are made permanent.

The Gatineau is known as a rough river on which to run logs. In the 100 miles from the river Desert to the Ottawa, there are 47 rapids and 22 chutes. In this distance from the Ottawa upwards there is an elevation of about 1200 feet. Mr. Bingham has the river divided into 37 sections, varying in length according to presence of rapids, speed of current, etc., from one-half to three miles. These sections are patrolled by permanent men.

The present is one of the busiest seasons Mr. Bingham has had in his 26 years' work as river contractor. He has delivered 850,000 logs, measuring from 13 to 16 inches in diameter. Last year he handled 500,000 logs. Each year he handles large numbers of ties and pieces of pulpwood, as well as the saw logs. This is the first season he has not had at least one raft of square timber down the Gatineau. Mr. Bingham



METHOD EMPLOYED ON THE GATINEAU RIVER FOR BREAKING A LOG JAM.

handles all the logs on the Gatineau, and supplies the following mill-owners: W. C. Edwards & Co., Ottawa; Gilmour & Hughson, Hull; Rideau Lumber Co., McLaren & McLaurin, East Templeton; Logan Estate, Maniwaki. He employs 350 men during the season, which extends from about May 1st to October 15th. Mr. Bingham oversees the work personally and knows the river thoroughly. He now handles the logs off limits extending 240 miles from the Gatineau. When he first started the logs were cut much nearer.

Mr. Bingham states that the reason for the decline in the production of square timber is the advance in the prices secured for finer grades. The Gatineau mill owners, seeing better financial returns in the latter, adhere to it. The Gatineau, however, was never improved for the passage of square timber as were the Coulonge, Black river and other tributaries of the Ottawa, and hence more was cut along the banks of the latter streams. Mr. Bingham cites his present season's business as proof that the Ottawa lumber business is not declining, although

It took six weeks to release the 500,000 saw logs, ties and pieces of pulp wood that became wedged at the Cascades retaining boom. This was the largest collection of logs and good

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the mill owners are going farther for their log supplies each year. He expects his contrivance here described to work a revolution in log driving, bringing a speedy and satisfactory solution of the difficulties that beset it, and robbing it of many of its picturesque and dangerous features.

To further facilitate the work of log driving on the Gatineau, Mr. Bingham has had a tug placed on the river this season. The boat, which only draws 31 inches of water, is built so that it can be hauled around the portages on a waggon specially built for the purpose. A great saving of time is effected in the drive, and the labors of the men lessened by the use of the tug. The unique craft is called the "Airn of Quebec."

Mr. Bingham has built the booms, piers, and other improvements on the Gatineau which facilitate his work of log driving. He has had an interesting and successful career. He was born on May 13th, 1840, at Bytown, now known as Ottawa. At the age of 13 he learned the milling business, following it for about three years, at the expiration of which



MR. SAMUEL BINGHAM, OTTAWA.

time he entered the employ of J. M. Currier and James Maclaren, for whom he worked four years. He was first employed as cook's assistant on a limit up the Gatineau, but in 1873 he turned his attention to log and timber driving, being rewarded for his application of intelligent, industrious principles by a bountiful share of success. The "River King," as he is known, is esteemed as a man whose bond and word are equally effective. His integrity and application have gained him the respect of all classes. In 1886 Mr. Bingham was nominated for parliamentary honors, but declined. Previous to this, in 1880, he was elected as representative of Ottawa ward in the City Council, holding the honor for eleven years. During this period Mr. Bingham occupied the position of Chairman of the Board of Works and Property Committee. Bingham Bridge, over the Rideau river, is called after him.

His fellow citizens had such a high opinion of Mr. Bingham's worth that they elected him Mayor of Ottawa in the years 1897 and 1898. As chief magistrate of the capital he exercised with wisdom and benefit to the city and citizens, the sterling business principles and ability that have gained him such a large measure of reward

in the lumber world. Mr. Bingham is considered one of Ottawa's leading public spirited citizens. He has fitted up a public gymnasium and in other ways has given evidence of the possession of a deep regard for the welfare of the youth of the capital. He has an ideal home on Sussex street, Ottawa. He has, with Mrs. Bingham, travelled extensively, and is an interesting conversationalist, having a thorough grasp of public happenings.

SAW-MILLING REVOLUTION.

Under the above heading the Australasian Ironmonger, of Sydney, Aus., describes a saw mill equipment imported from Canada which seems to be entirely different from anything in use in that country. The characteristic features of the different machines are referred to in the following manner:

"The most modern breaking-down saw in Australasia has already been mentioned. It has been imported from Canada by Mr. H. McKenzie, Australian Mills, Sydney, and shows the veriest new chum that saw milling will be completely revolutionized by its introduction. Very different to the old pit or frame saw, it is not easy to explain in type.

"First of all, the machinery is entirely above ground. The carrier resembles in shape that of a steam hammer. The saw is a complete band, 50 feet long, resting on and travelling over a pulley 9 feet in diameter. It is swedge toothed, and is driven at the rate of about 350 revolutions a minute, and as it is cutting all the time, this equals (allowing for irregularities in driving) 1500 feet of saw per minute, rather a contrast to the old vertical saw that cut its own length, and then had to be raised ere it cut again on the down action. That is all one sees at first sight. Now for details.

"Three men in three minutes raise the saw, place it on a frame above the carrying wheel, then slide it on, pass the guide arm into position, and the saw is ready for use. The engineer stands on a platform at the back of the saw, somewhat to the left. Grasping a lever he slowly starts the saw, and having seen that it is running smoothly, brings the speed up to the standard mentioned; then, with the hand on another lever, gradually draws the log up to the saw, and the squaring begins. The carrier is a wonderful piece of mechanism. It is controlled by steam, through a 10-inch cylinder, and is 42 feet over all. The engineer has such control that, having drawn the log up and made the cut, he immediately touches a lever, releasing two coil springs, which move the whole carrier and log about three-quarters of an inch away from the saw, so as to secure its safe return; another lever opens the valves of the cylinder controlling the carrier, and the 42-foot piston travels back three times as quickly as it came forward. Strong buffers are provided to prevent over-running. The piece cut falls on a plate between the engineer and carrier, and rollers, operated by steam, carry it away to the back of the mill.

"Part of the plant is a log-hauler. The mill is situated on the harbour's edge; the logs are floating below. The hauler has to bring each log from the water, and place it upon the carrier or feeder. This is done with an endless chain, studded with spikes, which, travelling under the logs, holds them by their own weight, and carries them to the correct level. Here revolving, parabolic-shaped drums, studded in the same manner as the chair, retain and control them on the level, and help to convey each in turn to the feeder carriage. Once there, the log is secured and adjusted very safely, though simply. There is no hand-spike business, or driving in of dogs, as of yore. The feeder is fitted with strong standards, called boss dogs, which contain finger grips which are out of sight till the log is in position, and then with the movement of a lever, suddenly leap out and seize the log. They are shaped like the fingers ready to grasp, or claws, nearly half-circles, and operate up and down, taking such a grip that it is impossible to move the log. Each standard may be operated separately, so as to conform to the shape of the log. When thus fixed, the engineer, with the aid of another lever, adjusts thickness of cut, which is gauged in notches.

"By the aid of this mill, Mr. McKenzie figures to cut 30,000 ft. of timber daily. So much for the saw. Now for adjuncts.

"At the ends, fore and aft of the carrier, buffers

similar to railway car buffers are fixed to either side of the carrier, should such occur. Behind the engine is fixed a gang edger, which, if needed, is brought into operation to dress the edges of any of the logs that may be at all irregular. It is a compact machine, and does its work in good style, cutting the same time any width required. Up another mill, the engineer, who was sent on several (of which several) have every other tool missing, and explain that the object was to allow for the growth of the ones, as the old were worn out through sharpness &c.; that the 50 ft. of steel, 9 in. wide, weighs something like 3 cwt., is of gauge 14. He also shows a sharpener, a smart little machine, with a revolving emery wheel and gauze setter, all of which worked by steam. It is necessary to place the standards, so as to have it on the back edge, and approach the sharpener. The standards are placed a circle to facilitate the handling.

"The makers of this really wonderful mill are Waterous & Co., of Brantford, Canada, and Mr. McKenzie £3000 to secure the plant, irrespective of expenses of erection and engagement of Mr. McKenzie, engineer. A view of the mill is of deep interest."

EFFECT OF SCALE IN BOILERS.

THE commonly accepted idea is that the efficiency of a steam boiler is seriously affected by an accumulation of scale. Perhaps the most often quoted estimate is the presence of 1-16 in. of scale causes a loss of 10 per cent. of the fuel burned, $\frac{1}{8}$ in. 38 per cent., and $\frac{1}{4}$ in. 60 per cent. Recently, says the Street Railway Journal, we have seen published statements tending to show that the loss of efficiency due to scale has been greatly over-estimated.

Prof. R. C. Carpenter, of Cornell University, was in the American Electrician, says that so far as he is able to determine by tests a lime scale, even of great thickness, has no appreciable effect on the efficiency of a boiler. A test which he conducted when the boiler was thickly covered with lime scale showed practically good results as when it was perfectly clean. The explanation is that the heating capacity is affected principally by the rapidity with which the heated gases will surrender heat, as the water and metal have capacities for absorbing heat more than a hundred times faster than the scale will. Any deposit which curtails the capacity of absorbing heat on the water side has very little effect either on total capacity or efficiency. A thin film of grease, however, being impermeable to steam, keeps the latter from the metal and generally produces disastrous results.

Mr. Walter M. McFarland, formerly an engineering officer in the United States Navy, in the course of a lecture at Sibley College, Cornell University, stated that his experience had been that a considerable thickness of clean uniform scale made apparently little difference in the efficiency of the boiler. On the U. S. S. Fish Hawk there were two boilers used for distilling water, and the water evaporated per pound of coal was no more when the boilers were clean than after three months when the scale was nearly $\frac{1}{4}$ in. thick.

On the other hand, there are recent tests showing that scale does reduce the efficiency. In May and June, 1900, Prof. L. P. Breckenridge, of the University of California, made tests on a locomotive boiler before and after cleaning it of scale and found that the loss due to scale was 9.55 per cent. The average thickness of the scale was 3-64 in.; analyses of samples taken at different points in the boiler showed from 20 to 67 per cent. calcium carbonate and from 4 to 40 per cent. calcium sulphate.

Also, copies of reports of tests sent us by the Victoria Boiler Tube Cleaner Co., of Pittsburg, show that there is a marked increase in the efficiency of the boiler when the scale has been removed. In one case the gain was 16.3 per cent. and in another 24.8 per cent.; the thickness of the scale was not stated.

The Victoria Lumber & Manufacturing Company, Victoria, B.C., expect to ship a large quantity of lumber to South Africa after the cessation of the war here. During the past three months they have shipped large cargoes to that market, and other vessels are now being at their mills at Chemainus.

HISTORY OF THE LUMBER INDUSTRY IN WINNIPEG.

LUMBER INDUSTRY IN WINNIPEG.

An interesting historical chapter relating to the early days of lumbering in Winnipeg is found in the recent issue of the Commercial of that city. Referring to the purchase of the lumber yard of Dick, Banning & Co., the Commercial says:

Dick, Banning & Co.'s business in the early days of the lumber trade in Winnipeg and Fort Garry (Winnipeg), so also does the early history of the lumbering industry in the province. The first account of the introduction of saw mill machinery was in the year 1866. Machinery for a combined saw and grist mill was purchased in Chicago, and brought into the country in the year 1866. The motive power for the mill consisted of 25 horse-power engine. The machinery was transported across the country from Chicago to the Mississippi river, where it was loaded upon flat boats and taken up the river to St. Paul, the head of navigation on the river. At St. Paul the machinery was loaded upon wagons and hauled by oxen across to the head water of the Red river, where it was placed upon flat boats built for the purpose, and floated down to Winnipeg. On arriving at Winnipeg the flat boats were broken up and the lumber of which they were composed was sold in the settlement. This was the first lumber imported into the settlement, and was the commencement of what afterwards grew to be a very important trade. On the arrival of the machinery at Winnipeg the work of setting up the pioneer mill was commenced, but owing to lack of knowledge on the part of the operators, considerable difficulty was experienced in making the machinery work. Finally, however, the mill was got into working order, and for a time did good service in supplying the settlement with both flour and lumber. The mill occupied a site within the present corporation limits of the city of Winnipeg, in the vicinity of Brewry's brewery, and was operated by a company of settlers. The investment, it is said, did not prove profitable to the proprietors, though there was always plenty of work to be done, and the mill was frequently kept in operation night and day. The logs sawn were the native timbers of the country, growing in the Winnipeg district, and consisting of poplar, oak, tamarac and spruce. The mill was burned in 1862, and so ended the first milling enterprise in the settlement.

About the time of the destruction of the pioneer mill another mill was established by Andrew McErmot. This was also a combined saw and grist mill, and was located near the spot where afterwards were built the Dick & Banning and the Jarvis & Berridge mills, on the Red river. Like its predecessor, this mill was also burned down, after serving the settlement for about ten years.

About this time the flat boat trade on the Red river was commencing to assume some importance, and lumber as well as other supplies were coming in from the United States in this way. It was also customary to sell the material of which the flat boats were composed for lumber, as the boats could not be taken back up stream to advantage. Lumbering on the upper Mississippi had by this time developed to a considerable extent, and lumber was coming into Mani-

toba by the flat boat route from that quarter from mills located at Minneapolis, Brainard and other points on the Mississippi river. With the construction of the Northern Pacific railway the lumber was carried to Moorehead, and thence brought down the river to Winnipeg. W. J. McAuley, of St. Paul, was the first to go into this business extensively. In 1873 he brought the first stock of lumber of importance into the settlement, which was rafted down the river as described. During the following summer McAuley & Co. commenced the erection of a saw mill at Winnipeg. This mill was sold to Jarvis & Berridge in 1879, but shortly afterwards was blown up and destroyed. It had a capacity of 30,000 to 35,000 feet per day. A new mill was built and a company formed, called the Winnipeg Lumber Co., which succeeded Jarvis & Berridge. The new company came into business at a critical time, when the lumber business was going down with the collapse of the "boom." The company did not prove a success, and the property soon passed into the hands of the banks which had advanced money to the projectors. The machinery of this mill was sold and moved to other points, some to Rat Portage. It was the largest mill ever established in Winnipeg, and had a capacity of about 100,000 feet daily, with battery of five boilers, and 250 to 300 horse-power.

The lumber firm of Dick, Banning & Co. date their commencement of operations here from the year 1872. Mr. Dick, who had visited the country during the previous year to look over the situation, returned from Ontario in 1872, with machinery for a portable mill. The machinery arrived by flat boat from Moorehead, and the cost of transportation from St. Paul was \$1,410.70. The mill building was burned some years ago, but the machinery had been removed previous to the destruction of the building. Mr. Dick formed a partnership with the late W. W. Banning, who died in 1885. The mill was operated up to 1882, when the firm bought out a mill which had been established at Keewatin, Lake of the Woods, by W. J. McAuley. The Winnipeg mill was then closed and the machinery moved to Keewatin, and a portion was sold to establish a mill in the Rocky Mountains. The timber sawn at the Winnipeg mill was such as the district afforded. The firm also operated a mill on Lake Winnipeg for a while, where they built a mill in 1878, but sold out a few years later. This firm brought the first lumber from eastern Canada to Manitoba, early in the seventies. It came in bond via Duluth, thence by the Northern Pacific railway to Moorehead, and from the latter place it was brought down the Red river to Winnipeg. This firm imported lumber and building materials from Minneapolis and other points largely, especially during the "boom" days, during which time it was almost impossible to keep up with the demand. In 1882 the firm brought in 10,000,000 feet, and paid nearly \$150,000 in freight that year. These were the halcyon days for the lumber trade in Winnipeg, when purchasers stood on guard waiting for a car of lumber to arrive, when it would be gobbled up, regardless of price, and always for cash down. The trade, however, made up for it during the following years, when stocks were greatly in excess of demand and prices were cut down to unprofitable figures. Before the "boom" period prices of

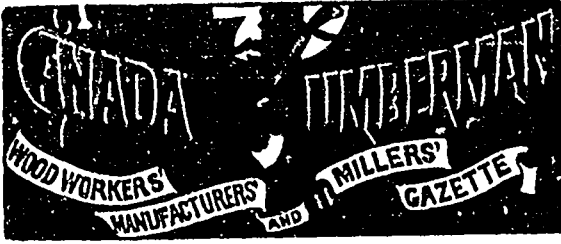
common lumber ranged about \$25 per M. During the "boom" period prices went up to \$30 per M. for common lumber, but after that period declined to \$15 to \$18 per M.

In the year 1882 J. R. Sutherland built a mill at St. Boniface, across the river from Winnipeg. The mill was a very good one, and had a capacity of 60,000 to 70,000 feet. It was a double circular mill, and was destroyed by fire in 1884. In 1882 D. E. Sprague built a mill in Winnipeg, single circular, with a capacity of 40,000 feet in ten hours. This mill is the only one which has been in operation here of late years, and it has been operated every year since established except during one season. The logs sawn at this mill come from the Red Lake district of Minnesota, down the Red River, and some good logs are also secured on the Rosseau river in Manitoba. The timber is pine. There is little timber in Manitoba tributary to Winnipeg now. On the Rosseau river, a tributary of the Red river, in Manitoba, there formerly was a considerable pine country, but this is now nearly exhausted.

This sketch covers briefly the main points connected with lumbering at Winnipeg. With the construction of the Canadian Pacific railway eastward from Winnipeg to Lake of the Woods, the centre of the lumbering industry was established at the Lake of the Woods towns of Rat Portage and Keewatin. A number of mills have been established at these points, and for many years the Lake of the Woods mills have remained the principal source of the lumber supply for Manitoba and the prairie region bordering Manitoba to the west. Supplementary lumber supplies are drawn from such districts as Lake Winnipeg and other timber regions in the northern part of Manitoba.

Present indications point to a revival of the lumbering industry at Winnipeg. The improvement of the St. Andrew's rapids, now under way, will permit of bringing logs up the Red river from Lake Winnipeg to the city, and this may possibly be taken advantage of to some extent to bring logs from the timber country tributary to the lake to this city for sawing. The construction of the South-eastern railway from Winnipeg to the Rainy river country is another important factor which promises to aid in reviving the lumber milling industry here. The Rat Portage Lumber Co.—the largest institution of the kind in the west, operating several mills at the Lake of the Woods—has already made arrangements to establish a mill in Winnipeg. This new mill will be in operation, it is expected, next spring, and the logs for the mill will be brought from the Rainy river district, over the Southeastern railway. Thus Winnipeg promises to once more regain to some extent at least some prominence as a lumber manufacturing centre for Manitoba.

The operation of cutting down an elm tree over three feet in diameter at Jacksonville, Ill., by means of wires heated by electricity, was successful, though slow. The cautery device consisted of a piece of 7-strand No. 16 iron wire connected with an electric light circuit, three of the strands being removed to afford air space within the cable. The current used was from 120 to 135 amperes, the voltage at the machine being varied from 80 to 115. After the wire became heated it was pulled back and forth like a cross cut saw, and in this manner it burned its way through the tree, the time consumed being 2 hours and 10 minutes.



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ADVERTISING RATES FURNISHED ON APPLICATION

THE CANADA LUMBERMAN is published in the interests of the lumber trade and allied industries throughout the Dominion, being the only representative in Canada of this foremost branch of the commerce of this country. It aims at giving full and timely information on all subjects touching these interests, discussing these topics editorially and inviting free discussion by others.

Special pains are taken to secure the latest and most trustworthy market quotations from various points throughout the world, so as to afford to the trade in Canada information in which it can rely in its operations.

Special correspondents in localities of importance present an accurate report not only of prices and the condition of the market, but also of other matters specially interesting to our readers. But correspondence is not only welcome, but is invited from all who have any information to communicate or subjects to discuss relating to the trade or in any way affecting it. Even when we may not be able to agree with the writers, we will give them a fair opportunity for free discussion as the best means of eliciting the truth. Any items of interest are particularly requested, for even if not of great importance individually they contribute to a fund of information from which general results are obtained.

Advertisers will receive careful attention and liberal treatment. We need not point out that for many the CANADA LUMBERMAN, with its special class of readers, is not only an exceptionally good medium for securing publicity, but is indispensable for those who would bring themselves before the notice of that class. Special attention is directed to "WANTED" and "FOR SALE" advertisements, which will be inserted in a conspicuous position at the uniform price of 15 cents per line for each insertion. Announcements of this character will be subject to a discount of 25 per cent. if ordered for four successive issues or longer.

Subscribers will find the small amount they pay for the CANADA LUMBERMAN quite insignificant as compared with its value to them. There is not an individual in the trade, or specially interested in it, who should not be on our list, thus obtaining the present benefit and aiding and encouraging us to render it even more complete.

HARDWOOD LUMBER INSPECTION.

INTEREST in the inspection rules adopted by the National Hardwood Lumber Association of the United States is, perhaps by force of circumstances, spreading to Canada. Some Canadian dealers have been shipping lumber to the Eastern States, and, we understand, have agreed with the purchasers of their stock to have the lumber inspected by a disinterested inspector appointed by the above association. This condition is to be welcomed, in that it is the probable beginning of what will ultimately result in the adoption of uniform rules of inspection in Canada. Whether the rules of the National Association could with advantage be adopted on this side is a question which must be decided by the trade, but it is certainly desirable that some uniform system of inspection should become generally employed.

Although as yet little has been accomplished in this direction, the CANADA LUMBERMAN is so hopeful that in the near future the trade will recognize the necessity of standard rules to the extent of taking definite action in the matter. The modus operandi of the inspection bureau of the National Hardwood Association is one which seems commendable. The Bureau is in charge of a surveyor-general, who divides the territory into districts and appoints a district chief inspector over each, also such inspectors as are found necessary. The only remuneration to inspectors

is the fee received from the buyer and seller for the inspection done. In case either buyer or seller is dissatisfied, the lumber is reinspected by the surveyor-general, whose inspection is final, and the party shown to have been in error pays the expense of the reinspection. Each inspector gives a bond for one thousand dollars that he will discharge his duties faithfully. The fees for the measurement of lumber are from thirty-five to fifty cents per thousand feet. Each inspector makes a report to his district-chief once a month, and remits ten cents for each thousand feet of lumber inspected. The district-chief remits to the surveyor-general seven cents for each thousand feet inspected, while the surveyor-general retains as his remuneration five cents per thousand feet and remits the remaining two cents to the association. The inspector's fees are payable to the inspector on demand by either the buyer or seller, as the inspector may elect, and in the absence of an agreement to the contrary the party paying the fees collects one-half from the other party to the contract.

The markets which have already adopted the national rules include New Orleans, Memphis, Cairo, St. Louis, Milwaukee, Minneapolis, Pittsburgh, Chicago, Baltimore, Buffalo, and the hardwood associations of Michigan, Wisconsin, and other States. The rules have also been endorsed and approved by the National Wholesale Lumber Dealers' Association.

THE HARDWOOD PRODUCTION.

A LESSON taught by experience is not usually soon forgotten. Such a lesson has come home to some of the hardwood manufacturers of Ontario within the past twelve months, and the result will probably be of advantage to the hardwood trade generally. The strong desire on the part of millmen to obtain a large supply of logs for the sawing season of 1900 brought about extreme competition, and in some instances such exorbitant prices were paid for logs as to make it impossible to get more than the saw bill out of them. Of course, it was argued that the past and prospective demand for lumber gave a great stimulus to buying logs, and that in the winter of 1899-1900 the outlook for high prices for lumber was exceptionally promising. But the unexpected frequently happens. The demand for hardwood lumber this year has been only moderate, and prices have accordingly receded. The mistake made in purchasing logs at almost any price became apparent.

As the logging season is approaching, it may not be amiss to express the hope that the lesson learned during the past year will not be forgotten. The tendency to over-production is one of the difficulties of the lumber trade which cannot easily be controlled. The manufacturer is, of course, anxious that his season's business shall show as large a percentage of profit as possible; in his desire to increase profits he forgets the danger resulting from over-production.

The shrewd manufacturer will not aim to make an excessive production, but will so control his output that even in the event of a depreciation of the market value of lumber, he may be able to balance up the year with a profit. In the absence of an organization in Ontario, it is extremely difficult to control the output of hardwood lumber, but if this phase of the business was given more consideration, the condition

of the trade might be greatly improved. An illustration of the usefulness of organization along this line, reference might be made to the Pacific Coast Shingle Manufacturers' Association, the members of which, by mutual agreement, close down their mills when the supply of shingles comes excessive. By this means the price of the product is maintained and a margin of profit to manufacturers assured.

The question of over-production formed the chief subject in the address of the president of the Michigan Hardwood Lumber Association at the annual meeting held last month. Alluding to the necessity of restricting the output of hardwood lumber, he concludes with the following timely advice: "Another important point to consider where firms come in contact in the purchase of logs, is the establishment of some uniformity in price, and not to bid up prices out of reason, to the detriment of all interested. Better to get out a reasonable amount and make money from it than a large amount with opposite results. This last competition also has a tendency towards accepting a poorer grade of logs, in which we all know there is no money to be made. Good lumber cannot be produced from such stock."

LUMBER CONDITIONS IN BRITISH COLUMBIA.

THE conditions surrounding the manufacture of lumber in the province of British Columbia have never been too favorable to the manufacturer. Although the industry has grown year after year, its development has only been accomplished by the exercise of great perseverance and energy on the part of lumbermen. Considering the large monetary investment and risk, the profits resulting from the conduct of the business have, in most instances, been inadequate. It is not surprising, therefore, that the lumbermen view with some alarm the recent action of the Provincial Legislature affecting the rebate on exported timber. The royalty charge by the government is fifty cents per thousand feet on log timber and shingle bolts, but for the past seven years a rebate of one-half this amount has been allowed when the manufactured product in lumber or shingles was shipped out of the province. Thus all shipments to the other provinces of the Dominion, as well as to foreign countries, were accorded the rebate of twenty-five cents. By an order-in-council, passed a couple of months ago, no intimation regarding which was said to have been given to the lumbermen prior to its enactment, this rebate on exported timber was discontinued. As the market for the timber products of British Columbia is largely beyond the boundaries of the province, a serious blow was thus dealt the lumber interests.

The ground for the action of the government is understood to be an opinion prevailing in some quarters that the province was not deriving a sufficient revenue from its timber. That a government should, in the interest of the people, obtain a reasonable remuneration from the sale of its raw material, will be admitted by all, but in striving to accomplish this end, care should be exercised that restrictions are not imposed which will render the industry unproductive and result in restricting its growth.

It may be that the lumbermen of British Columbia cannot fairly lay claim to a rebate on

SEPTEMBER, 1900

ber products exported from the province, but are certainly entitled to secure their raw material upon such conditions as will enable them to carry on the business of manufacturing lumber with peculiar advantage. The conditions surrounding the industry in British Columbia are different from those pertaining to other provinces of the Dominion. It is necessary to obtain mill equipment either in eastern Canada or from the Pacific coast states to the south. In the first instance, a large additional expense is added to the first cost of a mill by freight rates, and in the latter by the duty imposed on United States machinery. The cost of building a saw mill in British Columbia is considerably greater than that of a similar mill in eastern Canada. A second draw-back to manufacturing lumber in that province is the difficulty of disposing of the lower grades. It is not practicable to ship low grade lumber into Manitoba and the Territories, while only the higher grades can be marketed at a profit in eastern Canada.

The Canadian market is extremely limited, and the mill capacity much greater than the demand. The present capacity of the shingle mills of British Columbia, for instance, is 750 millions annually, while the demand in Canada where British Columbia shingles can be marketed is only about 200 millions. The present Dominion tariff, however, is such that the legitimate market in Canada is divided between the British Columbia manufacturer and the manufacturer in the western States. Under the customs tariff, lumber and shingles may be imported into Canada free of duty, whereas similar products shipped to the United States are subject to a duty of two dollars per thousand for lumber and thirty cents on shingles. This the Canadian manufacturer justly regards as a discrimination in favor of foreign competitors, and deprives the Canadian manufacturers of that degree of protection to which they are entitled. Why, they ask, should a duty not be imposed on American lumber similar to that on Canadian lumber shipped to the United States. But their grievances do not end here. While lumber, which must not of necessity be imported from the United States, is admitted free of duty, the tariff fixes a duty equal to about thirty per cent. on mill supplies, such as saws, belting, etc., which the British Columbia manufacturer must either import or purchase in the east at a large outlay for freight. There seems good ground for the contention that the lumber interests have been discriminated against in the matter of duty, and anything that will further hamper the development of the industry should not be countenanced by legislators having the interests of the country at heart.

The question of securing a supply of timber is one of paramount importance to the manufacturers in British Columbia at the present time. Originally established adjacent to timber limits, the mills in most cases are now a considerable distance from the forests. This has brought about a steady advance in the price of lumber and rendered it more difficult to obtain a sufficient supply. The removal of the mills farther up the coast will be the ultimate outcome. Some manufacturers are already considering this step, which will involve a large expenditure. The great problem is how to obtain a price for

their product commensurate with the additional expense thus involved, as the price of British Columbia red cedar and fir is regulated in a measure by competition from white pine and Washington red cedar and fir. Although the cost of timber to manufacturers has been steadily increasing in recent years, the selling price of the manufactured article has not advanced proportionately. As an instance, ten years ago the price of shingle bolts was about four dollars per cord, at which time shingles were selling in Manitoba at \$3 per thousand on a sixty cent rate of freight. In the past year the price of shingle bolts has been about four dollars, while the selling price of shingles in Manitoba has been in the neighborhood of \$2.35 per thousand. It is significant that some Canadian manufacturers have already removed their mills to Washington, where they can enjoy the advantages of both the United States and Canadian markets.

The British Columbia red cedar shingle is used largely in Manitoba and western Ontario, but in eastern Ontario it has been replaced to some extent of late by the white cedar and pine varieties. One advantage claimed for the red cedar shingle is that it will not warp. The reason for this is that the logs being large, it is possible to quarter-saw the timber and still obtain a shingle of considerable width. By the process of quarter-sawing a vertical grain is obtained.

The lumber and shingle manufacturers of the coast province are progressive and energetic even in the face of adverse circumstances. That their position is not altogether enviable is easily apparent. It is hoped that the government will place no further obstacles in the path of the lumber industry, but that some of the unfair discriminations which now exist will shortly be removed.

EDITORIAL NOTES.

GREATER use of the advertising columns of the CANADA LUMBERMAN might with advantage be made by persons engaged in the various branches of the lumber business who from time to time may be seeking new positions. The "Want Column" of the weekly edition affords a quick and effective means of reaching the lumber trade. An advertisement therein is almost certain to be more fruitful of results than if placed in the daily press, while the cost will be no greater—if as great. Mill superintendents, foremen, sawyers, filers, salesmen, inspectors and others seeking positions in connection with the lumber industry are requested to use the department freely. The LUMBERMAN reaches a large percentage of the saw mills in Canada. Mill owners might also avail themselves of its advertising columns to a greater extent when in need of skilled assistance. When desired, replies to the advertisements may, without extra charge, be addressed to a box at this office, and will be forwarded to the advertiser by the publishers.

It has been interesting to watch the struggle for popular favor between the different varieties of shingles. Our observations lead to the conclusion that the white pine shingle is losing ground, and that its field is gradually becoming more limited. In the western part of Canada, for instance, preference is given to the red cedar

shingle, while in eastern Canada the white cedar shingle is largely used. In Ontario the white pine shingle may be said to still hold the market, but even in this province it is meeting with severe competition from other varieties. One of the reasons for this encroachment on the white pine field is the comparatively lower price of cedar shingles. Another reason which has been advanced is that the quality of the white pine shingle is deteriorating, and that even the clear butts sometimes have worm holes in them. It is unlikely that the manufacturers of white pine shingles will endeavor to materially improve the quality of their production, as the high price of pine stumpage makes it necessary to convert into shingles only that portion of the log which will not make merchantable lumber. It is a significant fact also that the red cedar shingle as now manufactured is a much better article than that which was submitted to the eastern trade a few years ago.

TRAVELLING LIBRARIES FOR LUMBER CAMPS.

A movement is on foot to induce the Ontario Government to extend the scope of the Public Libraries Act so as to embrace the needs of lumber and mining camps. The Public Library Board of Little Current, Manitoulin Island recently passed a resolution unanimously requesting the Minister of Education to allow them the privilege of sending out small branch or travelling libraries to the camps in the vicinity. The Public Library Act provides for the establishment of branch libraries in municipalities, but most camps are outside of organized municipalities; hence the necessity of such permission. It is recommended that a travelling library commission be appointed and a sum of money appropriated by the Government with which to purchase travelling libraries of the most approved literature. In the meantime the Government is asked to grant to Library Boards the privilege of sending small collections of books into the camps on condition that a guarantee be given by the foreman and bookkeeper that the books shall be well taken care of and returned to the library when the camps break up.

We understand that the project has been strongly recommended by prominent lumbermen, including Messrs. J. R. Booth, John Charlton, M.P., A. E. Dyment, M.P., C. Beck, N. J. Young, Georgian Bay Lumber Co., Saginaw, Lumber Co., and others, and that it is expected to receive the favorable consideration of the Minister of Education. Mr. A. Fitzpatrick, of Nairn Centre, is the originator of the movement, and we hope his efforts may be crowned with success.

OUR EXPORT NUMBER.

THE special export number of the CANADA LUMBERMAN published in September has been most favorably received by the trade at home and abroad. Many lumbermen have expressed to our travelling representatives their appreciation of its value. Those who placed advertisements in this number state that they have received many enquiries from abroad regarding their products. Requests for copies of this number have been received from Great Britain, Germany, Italy and other foreign parts. As a trade developer it appears to have met all reasonable expectations.

MILLS OF MICKLE, DYMENT & COMPANY.

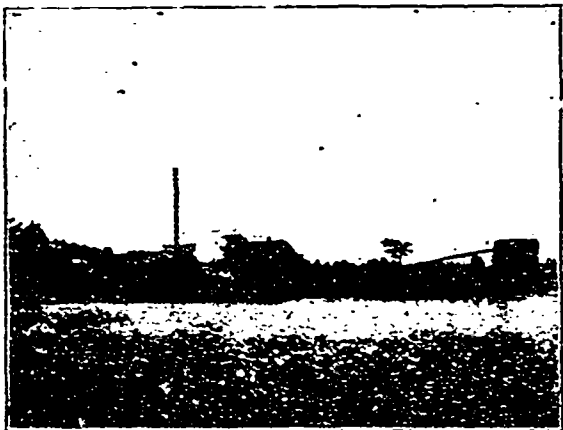
THE four illustrations on this page represent the saw and shingle mills owned by Mickle, Dymont & Company, whose head offices are at Barrie, Ont. The mills of the company are at Gravenhurst and Severn Bridge, one saw and one shingle mill being located at each of these places. The saw mill at Gravenhurst is operated by steam power, and consists of one circular and one band



MICKLE, DYMENT & Co.—SAW MILL AT GRAVENHURST, ONT.

saw, together with edgers, trimmers, lath machines, etc. The machines are operated by steam feed. There is a steam drag saw at foot of jack ladder for cutting bill logs of any size or length, claimed to be the only one in Canada. The planing mill is supplied with modern machinery. The capacity of the saw mill is 80,000 feet per day. In the shingle mill at Gravenhurst there are three Mowry and one Drake machines, their total capacity being 120,000 per day. The mills are provided with excellent fire protection.

The Severn Bridge saw mill contains circular and gang saws, with the balance of the equipment much the same as the Gravenhurst mill. It has a capacity of 90,000 feet per day. The mill and



MICKLE, DYMENT & Co.—SHINGLE MILL AT GRAVENHURST, ONT.

large yard are lighted by an electric light plant on the premises. The shingle mill in connection contains four Mowry machines of a daily capacity of 120,000 shingles.

The above mills are provided with lathe and repair shops and everything necessary for the manufacture of lumber to meet any demand. The lumber produced is chiefly pine, although several million feet of hemlock is also manufactured annually. The firm own extensive timber limits on the Georgian Bay district.

George Smith is building a new saw mill at Uthoff, Ont. The engine will be 100 horse power.

THE TIMBER OF NEW BRUNSWICK.

Mr. G. W. Hay has contributed a series of articles to the Educational Review entitled "Rambles through Forest, Lake and River," in one of which he refers to the forests of New Brunswick in the following manner :

We were now entering what might be called the great spruce country of New Brunswick ; and for weeks after our course lay through interminable dark forests of these trees, intermingled with birch and maple, especially on the ridges, with a few scattering white pines and no hemlock.

If our lumbermen would select the largest and best trees for their operations, gathering the tops and branches, with some of the smaller growth in the denser portions, for the pulp mill manufacturer, this great lumber region, and others through the province, would increase in value each succeeding year. The great need in these forests is a judicious pruning of small trees, especially on the low grounds, in order to give an opportunity for the stronger and more shapely trees to grow ; and the careful removal of branches and tops to lessen the danger from forest fires. Thus the waste products of the lumberman, which have been the source of so much damage in times past to our forests, and the stunted and mishappen growth of smaller trees in the denser woods, would not only be removed, but much of it made use of for manufacturing purposes. The great lumber country around the Tobique lakes has as yet been untouched by forest fires. The systematic and intelligent methods of the lessee of these vast forests, Mr. F. W. Hale, is adding to, rather than diminishing, their value from year to year, in spite of the quantity of lumber cut. This is the case in Germany, whose forests, in spite of the large and profitable lumber "cut" each year, are constantly becoming more valuable. And this is the result of trained and intelligent supervision. And so it would be in New Brunswick if similar methods prevailed. Our game and fish wardens should be trained in forestry. It would pay the government a hundred, yes a thousand-fold, to give our game commissioner added authority over forests, give him intelligent and trusted wardens, skilled not only in the knowledge and habits of game and fish, but also in forestry. It would take a little time to train such a body of experts, but the results would be great, placing New Brunswick in a position to preserve and add to what must prove the source of her greatest material wealth—her forests, her game, and her fisheries. At the same time she would place herself in line with those countries which, by wise and effective legislation, are laying a foundation for the preservation and future development of rich material resources.

PERSONAL.

Mr. Chas. E. Clarke, who for the past year has been acting as foreman for Clarke Bros. in their lumber business at Kingston, N. S., died on September 22nd, from typhoid fever.

The wedding of Mr. W. T. Murchie, of the lumber firm of Hale & Murchie, and Miss Mabel McKee was celebrated at Fredericton, N. B., on October 17th. The LUMBERMAN extends congratulations.

Mr. Linton, late superintendent of the Hay Furniture Company, Woodstock, Ont., has accepted a position with Gilmour & Company, of Trenton. Before leaving Woodstock he was presented by his friends with a complimentary address and diamond ring.

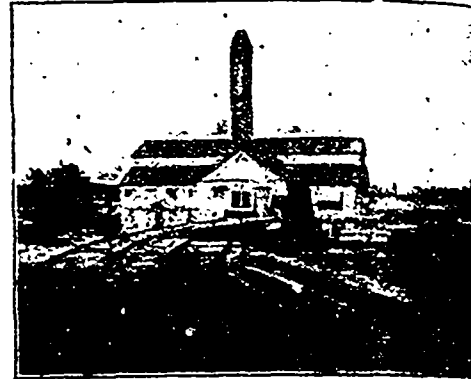
There died in Toronto last month one who for many

years has been well known in lumber circles, that of Mr. Robert K. Cunnell. Deceased was sixty years of age, and was engaged as a lumber dealer. He was grand-nephew of the late General Thomas K.C.B.

The LUMBERMAN regrets to learn that the recent death of Mr. Geo. McCormick, M.P. for the riding of the House, and although unable to take an active part in the campaign, it is regarded as a foregone conclusion that he will be returned.

Mr. Isaac Smith, a pioneer lumberman of the valley, was called to his last resting place on October 18th. The Smith Bros. were among the first to enter the square timber business on the Upper Ottawa operated extensively on their lands on the K. Coulonge, and Amable Du Fond rivers, to about 20 years ago, when they retired from business.

A rearrangement has recently taken place in the



MICKLE, DYMENT & Co.—SAW MILL AT SEVERN BRIDGE, ONT.

Lands Department of Ontario. Mr. Alex. Kirkwood, owing to ill health, resigned his position as chief of the sales and free grants branch. His successor is J. J. Murphy, whose position as clerk in charge of free grants has been given to Mr. E. S. Wilson, private secretary to Commissioner Davis. Mr. W. A. Findlay becomes secretary of the department. Mr. William's successor has not yet been appointed.

A welcome visitor to the office of the CANADA LUMBERMAN a few days ago was Mr. H. H. Spicer, manager of the Spicer Shingle Mill Company, of Vancouver, B. C. Mr. Spicer left home towards the end of August and visited Boston and some of the cities and towns of the Eastern Canada, combining business with pleasure. Spicer reports the lumber trade in the Pacific Province to be making progress, although at the same time suffering from some drawbacks which are not experienced in the east. His company are now making a large quantity of red cedar shingles, some of which have been shipped even to the Eastern States. They have remodelled their mill thoroughly, taking out the



MICKLE, DYMENT & Co.—SHINGLE MILL AT SEVERN BRIDGE, ONT.

horizontal ten block and two double block machines replacing them by four Dunbar and two Chicago machines. This has increased the capacity of the mill to 350,000 shingles in twenty-four hours. When the mill is operated day and night it will produce

Gropp Bros. are building a new saw and shingle mill at Pentanguishene, Ont.

1900

HANDLING SHINGLE SAWS.

By J. W. ...
 each the art of saw hammering,
 that may be of benefit to the
 There are so many opin-
 in a shingle saw that some
 is right. Allow me to state
 good work until it was properly
 wild about some person's ideas,
 and one that gives satisfaction,

age, size and speed change, as
 will, so there must be changes
 of hammering. Take, for in-
 rim by 8-gauge center, 42-inch,
 42-inch, and see the difference.

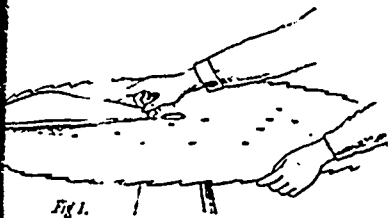


Fig 1.

a saw with a tight center and plenty of tension out toward the rim, but will not do good work.

In straining a shingle saw do not use the cross-face hammer to stretch the steel with, but use a round-face hammer and not very sharp. Be sure you have a tight rim on your saw before you try to run it. Some strain a saw a little more on the block side for horizontal machines. This is a help, but do not go too close to the rim with this treatment or your saw will run into the block, cutting a thick shingle, and will not last as long as if dished more near the center.

Do not hammer the rim of a thin saw any more than is strictly necessary, as the more you work the steel the faster it loses its strength. Use a short straightedge when evening up the tension, and be sure that it shows even tension from rim to center all around.

Now comes the use of the full-swaged tooth. This is a good tooth, but requires lots of work to keep it in proper shape; but without a doubt it is the proper shaped tooth for a rip saw. But do not overlook "economy," as some timber cuts well with the spring-set tooth, while some other kinds cut equally as well with full-swage; either will do the work if properly handled.

When testing your shingle saw for lumps, let the center rest upon the anvil, then use straightedge crosswise of a line from center to rim, which will readily show all bad lumps. Mark each one, and as fast as you level them erase the marks. Go around and around your saw until you are satisfied you can find no more. Use your tension gauge the same way, only letting the saw rest on each rim when you are evening up the tension on leveled side of saw, but do not try to use straightedge crosswise of the bevel on collar side. Always examine the tension in your saw after you have removed the lump, if any, as you may change the tension by taking out the little lumps.

Some ask me how heavy a hammer I would advise them to use on a shingle saw. I use a 4 1/4 pound hammer with not a very sharp face. But remember that you can spoil a thin saw with a 2 1/2 pound hammer if you do not use judgment when using it.

CHIMNEY CONSTRUCTION.*

By E. J. PHILLIP.

THE construction of chimneys does not give us much thought, like many other things we have to deal with, until we have to construct one, and when you begin to look up facts it will surprise you how little real information there is to be had on the subject. In the old country, where there are many large chimneys used for all purposes, there is on record much information both in reference to building, straightening and taking down. Most of the very high chimneys are used for other purposes than producing draft to burn coal, such as carrying off the poisonous gases from chemical works, etc. There is a book published called "Tall Chimney Construction," which gives the general details of many stacks built in the old country, and from these records you can make formula to guide you in designing a new stack.

Let us consider what is the proper method of designing a chimney for any given purpose. The first question is, "What is the chimney for, or what is it to do?" for this will govern some details of the shell. For instance, if it is to produce draft for ventilation, it will not require to be lined with fire-brick, nor will there be any benefit in putting in a loose lining.

We will suppose the chimney under our consideration is to induce draft to burn coal, as that is the most likely duty of any chimney that we will be connected with.

The size of the flue is the first dimension you will require, and it will depend on the quantity of coal to be burned and the velocity of the gases up the shaft. It is easily understood that as chimney powers increase, the dimensions do not increase proportionately. To illustrate this I will take some figures from a table in a reliable work:

A chimney 70 ft. high, 30" diameter = 100 h.p.
 " " 200 ft. " 66 in. " = 1000 h.p.

That is, the high chimney with five times the area equals ten times the power; and while I am not sure that this proportion is right, it seems to illustrate the way the formula works. The only correct way is to calculate the number of cubic feet of gas going up the chimney at the average velocity, and the area of this column is the area of the chimney. The rate of combustion depends

on the draft, and the draft depends on the height of the chimney and the temperature of the gases. The height of the stack is nearly always determined by the surroundings, as the stack must of necessity be above any buildings or hills, and I might say that the average stack is higher than is necessary. However, when there are no buildings or hills, the following formula will establish the height. This is known as Gale's formula:

$$= H \frac{120}{T} \left(\frac{F}{g} \right)^2$$

After getting the height, the area may be obtained by Kent's formula, which is: $A = \frac{.06F}{\sqrt{H}}$ In this rule the effective

area is obtained and is two inches less all round than the actual area. This two inches is to make up the friction of shaft. We now have area of chimney and height of it. I might say that experience has shown that to burn hard screenings requires 175 feet stack, for buckwheat 150 feet, and for soft coal 80 to 100 feet. This is a pretty fair basis to start from. We will suppose our chimney is, say, 100 feet high and 40 square feet area. It looks a simple matter to construct a stack having this information, and so it is, only you must go about it in the right way. To continue your calculations after getting the size, you start at the top and work down. Authorities say that a chimney having a flue over five feet in diameter shall be 1 1/2 brick thick at the top; from three to five feet in diameter, one brick; and under three feet, half a brick. A chimney five feet or over would have this size for the first 25 feet down and would increase 1/2 brick for each 25 feet. This, according to calculations, is almost too much. It can run 30 to 40 feet each stage, but will depend on kind of material, that is, whether hard or soft brick, and whether built in cement or lime; 30 to 40 feet will work with good material and workmanship. Having laid out the different thicknesses of wall, and knowing the batter, which varies with different builders and conditions from 1/16 to 3/8 of an inch, having this you can get the weight of shaft or chimney proper. In large chimneys it is usually specified what they shall weigh per cubic foot. After getting weight you can decide how much bearing surface you will require for the kind of soil you have at the foundation. Various bearing powers of soil are given as follows: Hard rock, native bed, 100 tons sq. foot; clay, dry, 4 to 6; moderate dry, 2 to 4; soft, 1 to 2; gravel and coarse sand, 8 to 10; sand compact and well cemented, 4 to 6; clean dry sand, 2 to 4; quicksand and alluvial soils, 1/2 to 1 ton per square foot.

When the ground is soft you would require piling or timbering, and to spread it out over a considerable surface. The weight in tons divided by bearing power of soil gives surface required. Wind pressure is also an important factor in getting the area of the base. I will not go into the rules affecting wind pressure, but experience has shown that at the base of shaft proper its diameter shall be 1/10th of height for square chimney, 1/11 for octagon, and 1/12 for round. In considering wind pressure it is usually figured at from 25 to 56 lbs., by different authorities. This must be resisted by foundation, as you can see that if the chimney rocks over with wind it will throw its entire weight on one side of foundation. In considering wind pressure it is necessary to take into account whether chimney is protected by buildings or standing in an open field. If the chimney is built into a building, windage may be almost disregarded except for piece above the roof.

There has been a great deal written and many discussions as to the merits of different shaped flues, but experience and tests have shown that a parallel flue is the best or as good as any shape. The arguments for taper flues are something like this, that the gases slow down due to cooling as they go up, and consequently they require more room, and the flue should get larger; others say that the gases cooling down contract in volume, and therefore the flue should get smaller so as to take the same shape as the column of gas. Experience has shown that both are correct. The gases contract and get smaller and consequently need less room, but they also slow down in velocity, due to their greater weight and therefore need more room. In this way they just balance up and require a parallel flue. Authorities say a round parallel flue is the best for all purposes, and the nearest approach is the next best.

The chimney should be finished with a cap of some material that will stand the weather. I like cast iron best, but a cap can be moulded of Portland cement, and if the stack is for smelting work, of fire clay. These materials stand well, and if there is a ladder on the chimney they can be kept in repair. A ladder should always be built on the shaft, as it makes a means of examining it at any time, and if repairs are needed they can be done easily.

Lightning conductors are also approved and disapproved; but if a chimney is the highest object in its vicinity it is likely to take the discharge from a storm over it, and a properly erected conductor will carry it off, although many stacks are standing without any

age used to do about half the work that people at the ordinary filer to accomplish with the 18-gauge. There is not more backbone to the 18-gauge than the 14, but to overcome it they speed the thin higher, which means more care, more hammered more tension, and this requires steadier and exactness of machine work.

For should be turned true and well balanced. I have a shingle saw collar turned true from rim to rim. Some order them low at the center, but experience me to have them true and alike. I have experience between the saw and collar, to level it, which where the machine shop is not handy. Some by having the collar low at the center it helps the saw from running out of the block, but a saw hammered will go to a straight line if properly

days ago I was called upon to hammer two 44-gauge saws which had 24-inch collars. These were of excellent temper and steel, also well ground. I had been sent back to the factory, but would not I tested them, also the collars. One collar was true to the center, so I made a ring of paper and placed it on the outer edge of the collar, which levelled it all the way. Then I tested the saws. The tension was very uneven, about two-thirds the distance from center to rim the center was very fast or tight, which would not permit the saw to cut straight; it would not

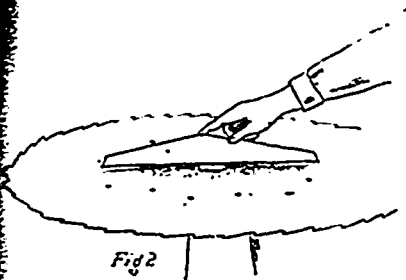


Fig 2

area cuts, no matter what the speed might be. I tested this saw until it showed even tension from center, or, in other words, from rim to rim. I then tested the other one, leaving them both alike as near as possible. You could not tell one from the other by the way they run, and both went to our entire satisfaction, resembling an extreme run, and would do good in maple or pine grape basket tops and bottoms 3/8-inch thick, 16 inches long, down to 1.5-inch through knots and curls, cutting bastard stock, and a thin saw, as the block may have a right-grain for the saw to start into and come out of a grain, which will change the course of the saw as it will. This may satisfy you that the center of a shingle saw must be opened to the balance of the saw to work well, no matter what the size of the collar. Don't dispute this without trying it.

Here with a sketch showing the tension in a saw will do fine work. It is a photograph of one of these saws that run so nicely. It has even tension all the way, both sides alike, and runs about 1,450 per minute. We will call No. 1. No. 2 is a photograph of

* Paper read before the Canadian Association of Stationary Engineers.

THE NEWS.

—S. P. Benjamin has sold his mill at White Rock, N.S., for \$3,000.

—Ker & Harcourt, of Paary Sound, are building a bobbin factory at Wiarton, Ont.

—W. F. Forest has commenced the erection of a new sash and door factory at Atwood, Ont.

Lequime & Powers are removing their sash and door factory from Midland to Greenwood, B.C.

—The Cloverdale Milling Company has been established at Cloverdale, B.C., to manufacture lumber and shingles.

—Henry Pedwell, of Thornbury, Ont., has purchased a site for a saw mill at Lion's Head, and intends to build at once.

—The Mississauga Lumber Company has been incorporated, with capital of \$72,000, and head office at Hamilton, Ont.

—The dissolution is announced of Bashford & Fisher, hardware and lumber, Rosthern, N.W.T., W. B. Bashford continuing.

—Mr. Misner is building an addition to his mill at Springfield, Ont., in which to manufacture heading and cheese boxes.

—It is reported that eastern capitalists contemplate the erection of a factory at Norman, Ont., for the utilization of the waste of the saw mill.

—Cowan & Company, of Galt, are supplying machinery for the new wood-working factory of John McDonald & Company, at Chatham, N.B.

Arthur S. Potter and J. B. McIntyre, of Pittsburg, Pa., are said to be investigating a timber belt in British Columbia, with a view to building a large saw mill.

A dispatch from Warren, Ont., states that Mr. Malloy, agent for J. R. Booth, of Ottawa, is offering from \$40 to \$50 per month and board for log hewers and scalers.

—A Buffalo firm have made a proposition to the town council of Welland, Ont., to establish a factory in that town for the manufacture of wooden tanks, boxes, etc.

—The Watson Point Lumber Company have commenced work on the building of a new saw mill at Sydney, C.B., which will have a capacity of 20,000 feet of lumber per day.

—Cockburn & Sons, of Sturgeon Falls, Ont., have entered a claim against the Edward Lloyd Company for \$10,890 alleged to be due under contract for cutting timber.

—Sawyer & Mann, sash and door manufacturers, Revelstoke, B.C., have dissolved partnership, and the business will be continued under the name of Sawyer Bros.

—An excelsior factory is about to be established at Port Arthur, Ont., by Wylie & Company. The wood used will be poplar, of which there is a great quantity in the district.

—Hemlock stumpage has greatly advanced in price in late years, until it is now held almost as high as that of pine. The sale of hemlock bark covers a portion of the cost of logging.

—The mill which Edmund Hall, of Saginaw, is building at Sarnia, Ont., is not likely to commence operations before next spring. It will have an annual capacity of about 20,000,000 feet.

—H. L. M. Weller, of Toronto, has entered an action against the Blind River Lumber Company claiming commissions amounting to \$3,000 on the sale of a saw mill property at Blind River.

—The J. H. Still Manufacturing Company, of St. Thomas, Ont., is seeking incorporation, to carry on the business of manufacturing wooden handles and other kinds of wooden-ware.

—The Simon Bros. Manufacturing Company, of Wiarton, Ont., have installed a new 175 h.p. engine in their furniture factory. The machinery for their new table factory will likely be put in this month.

—George Wilson & Company, of St. Catharines, Ont., have made a proposition to the council to build a box factory to cost upwards of \$15,000 in consideration of exemption from taxation and free water.

—The London Vencer Company is building a factory at London, Ont., for the manufacture of veneered boxes, chiefly for export. The company is composed of Messrs. Craig, Fitzgerald, Scandrett, and Forestal.

—Napoleon Matthew, an employee at J. R. Booth's saw mill at Ottawa, disappeared from his home in Hull two weeks ago, and has not been seen or heard from since. Foul play was at first suspected, but it is now thought Matthew left for the shanties.

—Arpin, Scott & Finger, of Grand Rapids, Mich., are negotiating for the purchase of the large mill of Graham, Home & Company at Fort William, Ont. If not secured, they will build a mill. The firm own 150,000,000 feet of pine timber on Pigeon river, on both sides of the border.

—Information from Ottawa received early in October stated that Roy & Savigny had just started thirty men to Crow river to work for Gillies Bros., of Braeside, and that they were then engaging 120 men, at an average wage of \$28 per month, to send to the Holland & Emery Lumber Company at Wahnapiatae. Chevrier & Limoges have also booked a large number of men for the camps in the Ottawa and Georgian Bay districts.

—The first of the New Ontario exploring parties returned to Toronto early in October. Mr. Baird, who was in charge of the party, reports that they started out from Grasset's Station, on the C.P.R., and travelled

north and east for nearly three hundred miles along the Moose river, turning back when only about six days journey from James Bay. They found an almost unlimited quantity of spruce, poplar, white wood and lumber, also a little red and white pine and cedar.

CASUALTIES.

—Elzear Desceand, of Hull, was recently killed at R. Booth's saw mill at the Chaudiere. He was crushed between the head blocks of the log carriage and saw timber projecting from the end of the carriage track, and died almost immediately.

—Benjamin McDonald was accidentally killed in a lumber camp near Warren, Ont., in September last. He ceased was a native of Ottawa.

—Wm. Burd, who had been employed in Playfair's mill at Midland, Ont., for the past six years, was caught in the shafting and instantly killed on October 2nd. He was 43 years of age and leaves a widow and one son.

A. Clothier, of Kemptville, Ont., says of the CANADA LUMBERMAN: "I have been very much pleased with THE LUMBERMAN, and think every millman should subscribe for it."

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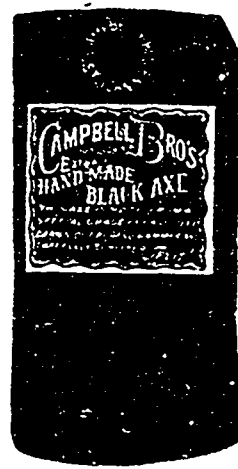
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A NOVEL CHIMNEY.

A chimney involving some features of construction which are rather novel, at least in this country, says *Country and Building*, is the one which has been erected in connection with the new power plant at the Joseph Dixon Crucible Company, at Jersey City, N. J. The chimney is built of radially moulded bricks perforated in such a way as to insure regularity of draft by preventing radiation through the walls and thus diminishing the susceptibility to atmospheric changes. The bricks are moulded in sizes and shapes of sufficient number for the construction of a chimney of any diameter, and of conforming decreasing radius to the progress of the structural elevation. The perforations are intended not only to form dead air spaces, but also to give a better hold to the mortar, and, it is said, to increase the joint adhesion.

HANDLING SHINGLE SAWS.

J. W. Ball, in the *Wood-Worker*, says: A knowledge of straining or tensioning shingle saws is becoming more necessary for a filer every day. Fifteen years ago the feeding of shingle saws was principally done by men of middle age. Why? Because they had more patience and experience than the young man of that time. There are men that can hammer shingle saws so that a man of little experience can do good work on them. I have hammered 18-gauge shingle saws for men to run that had not two months' experience, and they made a success of it just because the saws were properly hammered for the motion. I will not attempt to explain saw-making, but will say a few things that may help the filer.

I have known of a shingle saw being hammered without removing it from the flange. Never do this as no man can tell much about it this way. Always take the saw from the flange. Use the straightedge from center to rim, then use it crosswise of a line running from center to rim. Do this over every inch of the saw. If you use a long straightedge on a saw that has lost all its tension,

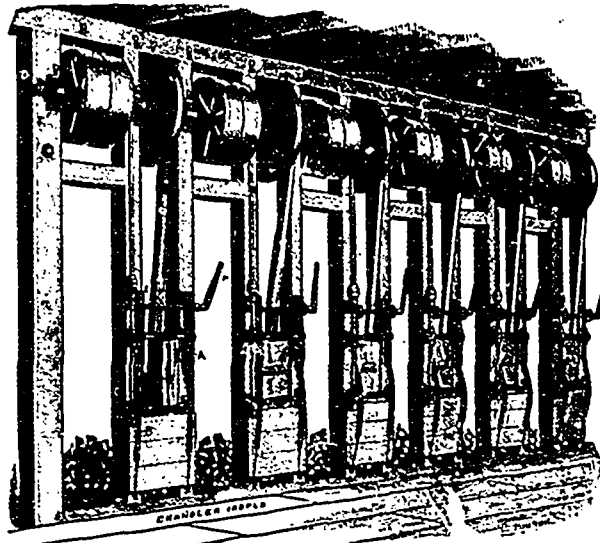
you may find it to stand in a twist. Do not try to bend this twist out as, the rim being so loose, will cause it to stand in this twist; simply stretch the saw from center to very close to the rim. When you have done this on both sides of the plate and filed the body of the saw, you will not be able to find that twist; but do not fill the center too full.

When using the straightedge on the bevelled side of the saw you may run it from center to the outer edge of flange seat, then from there crosswise of a line running from center to rim. Use a 12-inch straightedge for this, then to finish use as short as 6-inch. Be sure that your shingle saw shows tension clear out to the rim, leaving the extreme cutting edge the tightest; with a gradual or even tension toward the center. For saws 40 inches in diameter, 16-gauge rims, to run 1,600 per minute, the center should sag from a straightedge that reaches clear across the plate, about 7 gauges; that is, the thickness of a 7-gauge piece of steel. If the saw is of good temper and steel it will be about the proper thing, but if the extreme

cutting edge is not the tightest it will not do its work if the center should sag one inch, but would flutter on the rim when under motion.

You cannot tell much about your saw when screwed down to the flange; that is, about the tension. Always take it off the flange to test the tension or strain. Some people hammer more on the block side of the saw so as to hold it into the block a trifle, but for vertical machines I prefer it tensioned perfectly even, both sides alike; for horizontal machines they work well strained a little more on one side—just enough to counteract the weight of the rim, as it has a tendency to lop down a trifle when under motion. Do not use a cross-face hammer to take tension out of a shingle saw; use the round-face or dog-head, with not very round or sharp face, so it will not cut the plate. Use a steel-faced anvil and have it a little oval or a little high in the center. Do not use a flat anvil for shingle saws; it will not give the desired results. I like a 6x9-inch, or a round-faced anvil say 7 inches in diameter, of about 80 pounds weight. I use the 4½ pound hammer to strain or tension with and 2½-pound hammer to even and finish with, but this is to everyone's option. Use what you can handle best is my advice.

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WOOD PULP DEPARTMENT

JAPAN IMPORTS OF PULP.

The following table shows quantities and values of wood pulp imported into Japan for the years ended December 31, 1897, 1898 and 1899:

Countries.	1897. Quantity. Kin.	1898. Quantity. Kin.	1899. Quantity. Kin.
British America		378,917	2,874,453
Denmark		26,880	
Germany	871,053	2,592,160	2,092,211
Great Britain		246,901	1,668,503
Sweden and Norway	553,046	1,241,007	380,422
United States	1,369	1,579,732	172,608
Other countries	8,400		
Totals	1,433,868	6,948,597	6,588,197

NOTE.—Kin=1,3251 lbs.

BRITISH IMPORTS OF PULP.

THE Board of Trade returns have just been issued showing the imports of wood pulp by the United Kingdom for the year 1899. The figures show an increase in the importations of chemical pulp and a decrease in mechanical pulp last year as compared with the previous year. Of chemical pulp the importations in 1898 were 179,525 tons and in 1899 196,926 tons. Of this 10,116 tons were imported from Canada in 1898 and 5,754 tons in 1899. The total importation of mechanical pulp was 225,317 tons in 1898, and 218,187 tons in 1899. Of these quantities 36,569 tons

were received from Canada in 1898, and 36,288 tons in 1899. The bulk of the importation was from Norway, which is represented by 141,455 tons and 162,894 tons in the two years, respectively.

AMERICAN SULPHITE MANUFACTURERS' ASSOCIATION.

Since our last issue a meeting of the above association was held at Boston, at which The E. B. Eddy Company, of Hull, The Cushing Sulphite Fibre Company, of St. John, N.B., and The Maritime Sulphite Fibre Company, of Chatham, N. B., were admitted to membership in the association. This leaves but one Canadian company, namely, The Laurentide Pulp Company, of Grand Mere, Que., not represented. An intimation was received from one of the influential directors of this company stating that he would recommend to the Board that membership in the association be applied for. The Sault Ste. Marie Pulp & Paper Company, of Sault Ste. Marie, Ont., will commence the manufacture of sulphite pulp at an early date, with a daily capacity of forty tons, and is also expected to join the association. An inventory of stock on hand showed that the mills composing the associa-

tion were well sold out. The association represents a production of 800 tons of sulphite pulp per day. It was unanimously decided to maintain the price of No. 2 sulphite at the minimum of 2.10 cents.

NEW PULP MILL AT THOROLD.

The new pulp mill which has just been commenced by the Thorold Pulp Company will be located on the old Welland canal, just above Lock 22. The power will be furnished by the canal, having a head of 14 feet at this lock. There will be five horizontal American water wheels, four of which will drive directly on to the grinder line. The capacity of the plant will be about 10 tons. There will be two Diltz grinders, two wet machines, four screens and wood preparing machinery. The company will use spruce wood exclusively and will be prepared to make a very fine grade of pulp.

The grinders will be located in the basement, whence the stock will be pumped to a stock tank in the second story, from which the stock will flow by gravity to screens and wet machines, necessitating only a stock pump for the entire plant. The water supply will also be from the canal, and the filter box will be supplied by gravity. The entire wheel pit and bulkhead will be of stone, laid up in Portland cement mortar, and the flume will be of heavy timber, lined with 3 inch plank. The first story of the building will be of coursing stone, laid up in cement. The second story will be timber frame and sheathed with iron. The entire first floor will be of cement.

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Falls, N. Y. The ground has been broken and the stonework begun. Unless delayed by the non-arrival of machinery the mill will be in operation by Christmas. The mill was designed by Charles H. Vogel, of Thorold.

The incorporators of the company are Thomas H. Paterson and W. M. Davidge, of Niagara Falls, N.Y., and J. Brown, Elmer E. Rowe and Ed. Morris, of Warsaw, N. Y. The capital stock is \$30,000, all paid up.

OUR EXPORTS OF PULP.

FROM the unpublished returns lately issued of the trade for the fiscal year ending with June last, it is impossible to get an idea of what the total sales of Canadian pulp and paper amounted to in that year, nor any idea of what the paper imports from the several countries totalled. Of books, pamphlets, etc., there were imported in that fiscal year \$1,191,614 worth, as against \$1,119,805 in the year 1898-9. The value of the paper and envelopes imported amounted to \$1,401,698, as against \$1,247,885 in 1898-9. The exports of pulp to Great Britain show a marked increase. They rose to \$687,256, as against \$310,385 in 1898-9; that is, they more than doubled in value. In quantity the exports of Canadian pulp to Britain were almost two and a half times as great last year as in the previous year, being 40,801 tons, as against 16,445 tons in 1898-9.

But the exports to Britain were far from being the only ones. Those to the United States, says the Paper Mill, must have been quite large, though the increased returns do not particularize them. Last fiscal year there was more sulphite fibre shipped across the line than ever before. Also, considerable quantities of ground pulp were sent thither.

It would be interesting to know the value of the exports in pulp wood, but of these the reports, in their present state, say nothing. It is probable they are not materially more or less than the average of the previous three years. Though the Ontario law prohibits exports from the Crown Lands, the statute did not cover last year. Expecting it this year, the American importers would doubtless get out all they could. But against their extra efforts are to be placed the facts that the streams were not full all the rafting season; that the timber has to be sought farther in the interior; that prices were higher, and that the Quebec law was in force from the date of enactment. Thus exports of pulp wood to the United States might be less than they were in 1898-9, but they would scarcely be more.

A report just issued by the Department of Trade and Commerce at Ottawa gives the returns of trade with many foreign countries for the last three years. Japan's trade is interesting from the fact that last year Canada's chief article of exportation to that country was wood pulp, Canada contributing more than one-third of Japan's total imports of it.

PULP NOTES.

A movement is on foot to erect a pulp mill at Ladysmith, B.C. The timber of Vancouver Island is said to be well adapted for the manufacture of paper and fibre ware.

At Brompton Falls, Que., the by-law granting a bonus of \$10,000 to the American Paper Company to erect a pulp and paper mill at that place was carried last month without opposition.

The Consolidated Pulp & Paper Company, of Toronto, expect at an early date to be in a position to commence work on the enlargement of the Thomson pulp and paper mills at Newburg, Ont.

A by-law to grant a bonus to the Patterson Pulp Company was defeated by the ratepayers of Thorold, Ont., a few weeks ago. It is said, however, that the building of

the mill will be proceeded with immediately, from plans prepared by Mr. Chas. H. Vogel.

The Laurentide Pulp Company, of Grand Mere, Que. held their annual meeting in Montreal a fortnight ago, at which the Board of Directors was re-elected. Mr. Alger will continue as manager.

A number of Boston capitalists have formed the Nova Scotia & Boston Wood Pulp Company and purpose erecting a pulp mill at Wentworth, N. S. The resident manager will be Mr. C. E. Meserve.

C. B. Pride recently returned to Appleton, Wis., from a visit to the Rainy Lake district in north-western Ontario, where he made preliminary surveys of a water power which it is proposed to utilize for a large pulp mill.

Mr. W. R. Calder, of Bridgewater, N.S., recently went with a surveyor to Hamilton Inlet, on the Labrador coast, where he has in view the erection of saw and pulp mills. It is stated that he has an option on 300 miles of timber lands covered with an excellent quality of young spruce.

The following are the principal countries that supply the German market with chemical wood pulp, the percentage relating to supplies during the first half of 1900: Austro-Hungary, 59 per cent.; Finland, 16 per cent.; Sweden, 13 per cent.; United States, 23 per cent.; Norway, 1 per cent.

There seems reason to expect that a pulp mill will be built at Dryden, Ont. It is stated that the concessions asked for by the company will be granted and that active operations will commence next spring. The venture is financed by English capitalists who propose expending half a million dollars in the preliminary work. Charles Campbell, a paper maker of New York state, and a Mr. Wright, of England, are interested.

Scandinavian manufacturers of pulp and British manufacturers of paper are in a controversy that is interesting, not to say amusing, and it is a question whether the point at issue would be classed as a theory or as a condition. The Scandinavians contend that the product of their mills is already sold ahead; that prices are going to be high, and that anybody who does not immediately "get on board the train will be left." On the other hand, the Englishmen say that they are not only well provided with pulp, but that they are even turning an honest penny by selling some of their surplus, and that they can get all they want from Canada, and therefore are independent of the Scandinavians. The real point of interest in the affair is this, that the English paper manufacturer has now become so well accustomed to the use of Canadian pulp that he regards Canada as a natural source of supply, and that hereafter the battle between the Scandinavian and Canadian mills will be fought out solely on the issues of price and quality, regardless of traditions and customs that have prevailed heretofore. The tactical position of the Canadian pulp manufacturers has been improved vastly within the past two or three years.—Paper Mill.

SPECIAL NOTICE

We have inaugurated a **STOCK REDUCING SALE** for October, November and December, and will quote reduced prices on all inquiries received for shipment during time named.

We have a complete stock in all kinds, grades and dimensions, one to two years old, Bone Dry Hardwood Lumber, Yellow Pine and Cypress, kiln dried Maple Flooring, plain and quartered White and Red Oak Flooring, Surfaced Lumber, Wagon and Dimension Stock, and can ship straight or mixed car lots, quick delivery.

We have numerous stocks, last year's cut, piled in connection with saw mills in the country that we propose to close out and will quote you on a basis of lumber made, dried and delivered from the stump to your factory (no yarding expense). Besides we are offering special prices on Quarter Sawed Forked Leaf strictly White Oak, all one kind and color, well manufactured, band sawed, principally large figure, good widths and bone dry, including Quarter Sawed Red Oak, uniform color, quality and grade.

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AXE AND SAW COMPETITIONS.

At the annual meeting of the Australasian Axemen's Association held at Sprent, Tasmania, Australia, on July 21, 1900, a feature of much interest was the international teams' matches, inaugurated for the purpose of giving British manufacturers an opportunity to prove that they could make tools of quality equal to those made by their successful rivals, the American manufacturers. The result is given in the Australasian Ironmonger, as follows: In the axes, the beautiful gold medal given by the association was won by W. Hunt & Sons (Brade's Ltd.), England, with "Plumb" axes, America second. Several other American and English makers showed up wonderfully well, and the final between England and America created intense excitement. This great win for the home land should largely help to bring English axes into favour again. The gold medal for saws was contested for by only the three great American firms, Disstons, Simonds and E. C. Atkins, and the Atkins saws scored a meritorious victory, the Simonds being second. The correctness of this decision has come out in a marked degree during the months since the sports, for the Atkins saws used in the contest, having been distributed among professional sawyers, have won splendid unsolicited testimonials for their cutting powers and all round quality. The gold medals for files and axe handles were both won by American firms.

RUSSIAN SAW MILL PRACTICE.

A CORRESPONDENT of the American Lumberman says: There is very little in the handling of logs in a Russian saw mill to distinguish it from similar institutions in Europe, although it is usually vastly different from the modern American band mill, with its many labor-saving appliances—not all of which, it must be admitted, are material-saving as well. Probably the most universal implement for reducing logs to thin lumber is the saw frame or gang through which the entire log is fed without first reducing it to a cant. The resulting boards are often piled and seasoned with the outer bark upon them. They are usually edged, however, before being transported to any considerable distance. In some of the remote portions of Russia the old primitive pit saw is still in use, one man standing upon the log and his fellow-workman in the pit underneath it, the saw being manipulated in an approximately vertical direction. It is only on the far Russian frontier, however, that this method is in vogue. Special forms of portable saw mills are, however, often used, a small gang frame on wheels being the more common type. Of course, a temporary timber foundation is constructed for it wherever it is set up.

The circular saw is also used to some extent for the cutting of logs into timber, but usually finds its greatest application in the different varieties of cut-off saws, edging-saws, slab-saws, etc. For the cutting of the more expensive

woods for cabinet-maker work the band saw is also coming into use, and one or two of the larger saw mills are already quite extensively equipped in this direction, some of them with machinery of American manufacture. Other devices, such as live rolls, etc., are also in use, and the various forms of planing machines correspond quite closely to ours, although for surfacing timbers they still retain the form in which the planing knives are set in the face of a circular disk which revolves horizontally upon the upper face of the timber. This form of planer is almost unknown in this country at the present time, although one was in use for surfacing timbers in Chicago as late as four or five years ago.

IT IS HELD IN HIGH ESTEEM.

Mr. Ed. Sykes, Lady Bank, Ont., in renewing his subscription for another year, writes: "I esteem the CANADA LUMBERMAN very highly, and should not like to be without it."

R. D. Walsh, of Chatham, N. B., has added to his factory equipment a large planer and matcher.

The Canadian Rubber Co., Toronto, in receipt of a letter from the Conger Lumber Co., Toronto, in which they say: "Replying to your favor of the 21st asking our opinion of the rubber belts furnished us, we write to say generally that they have uniformly given excellent satisfaction. Respecting the large twenty-inch driving belt you recently made for us, we can only say we don't see how a better belt could be made."

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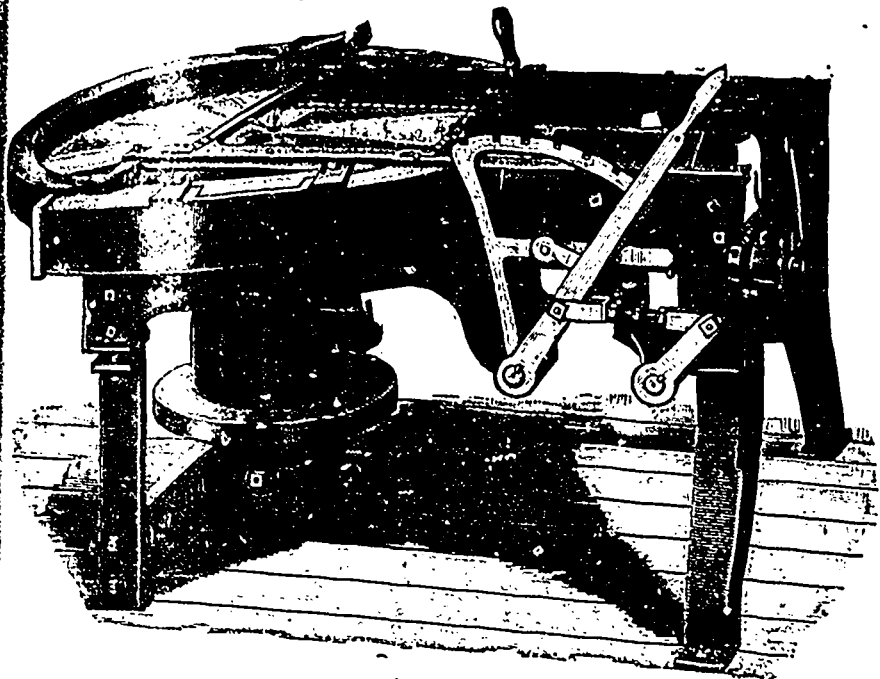


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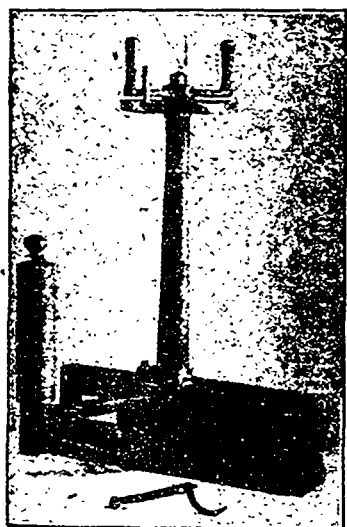
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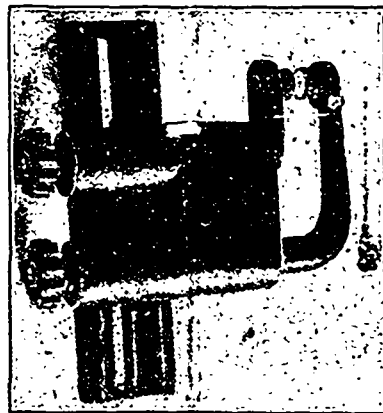


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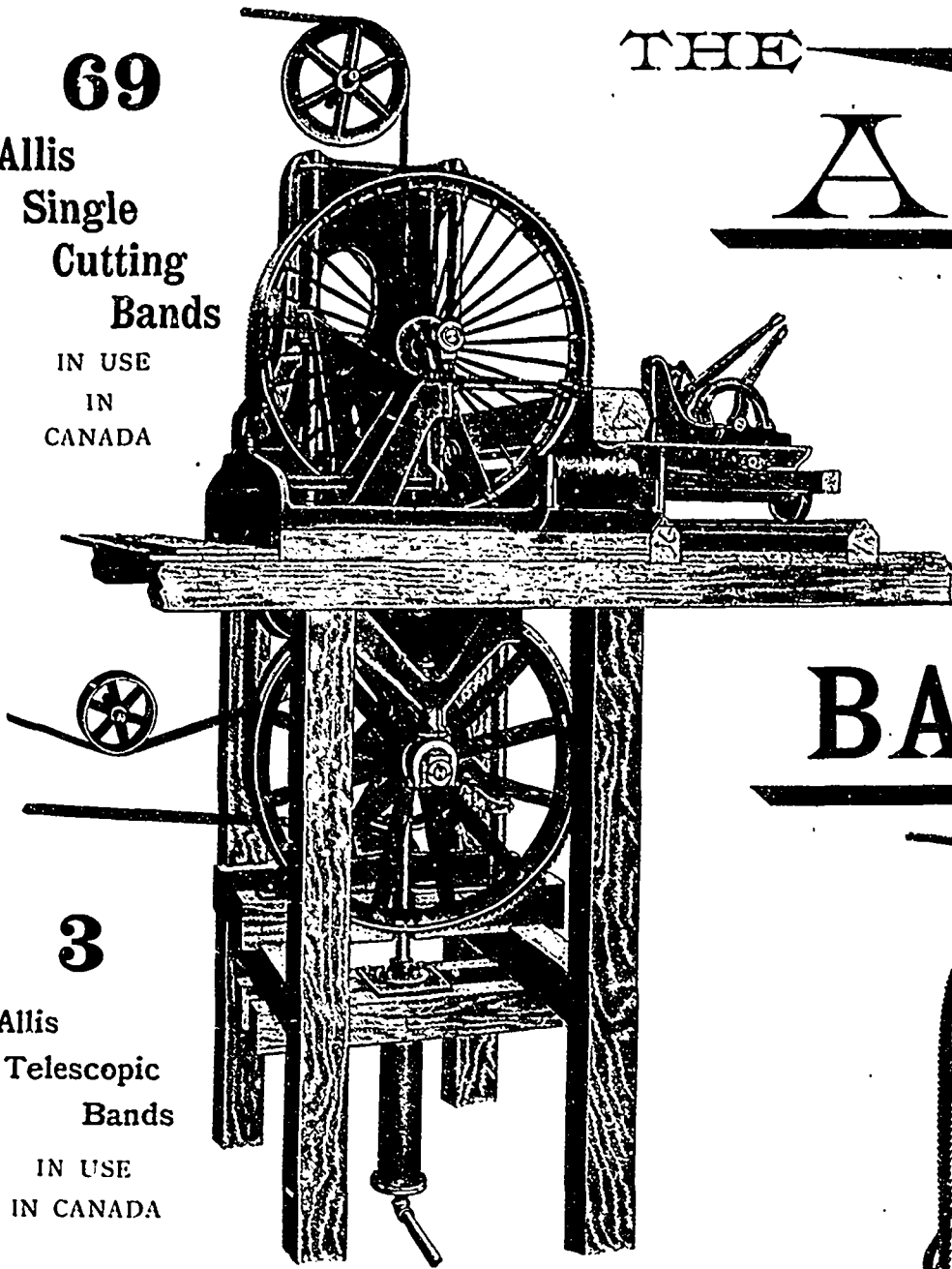
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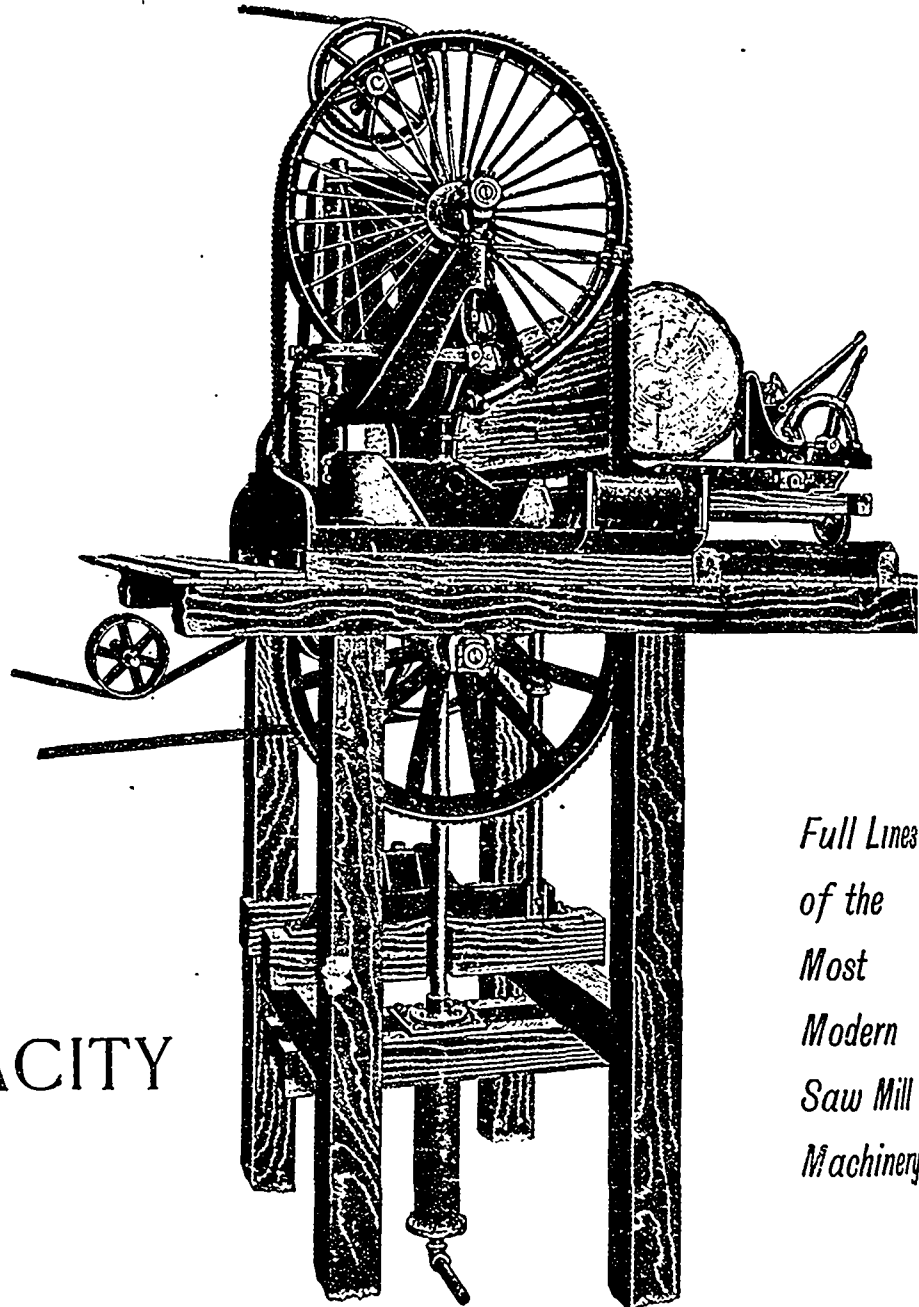
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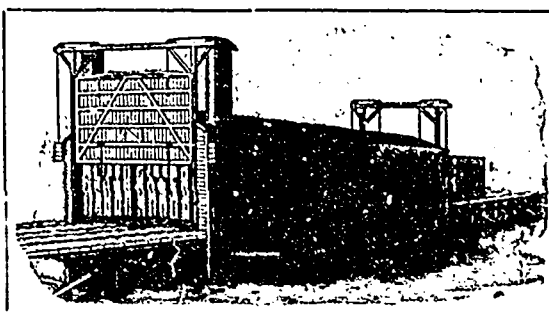
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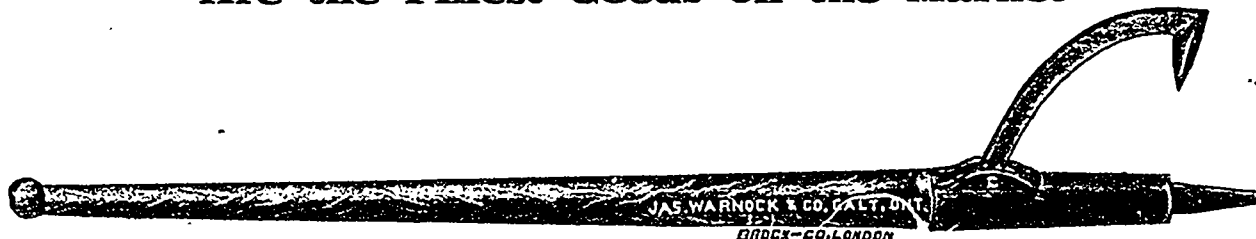
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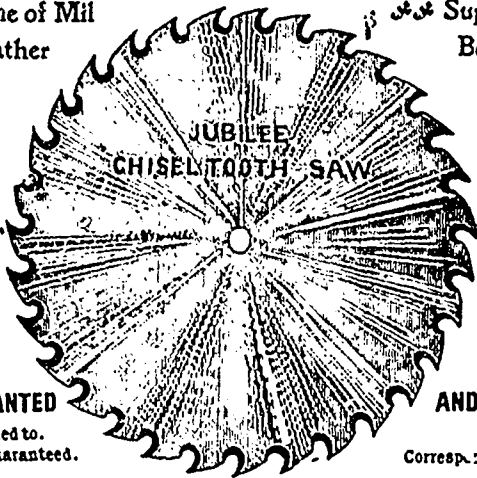
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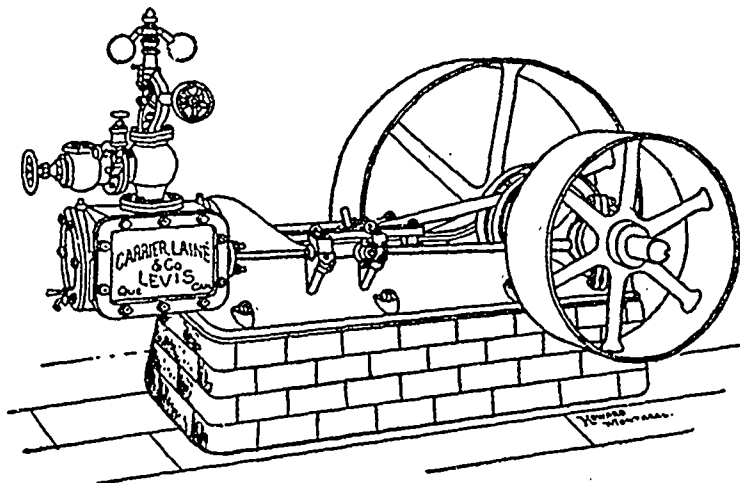
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