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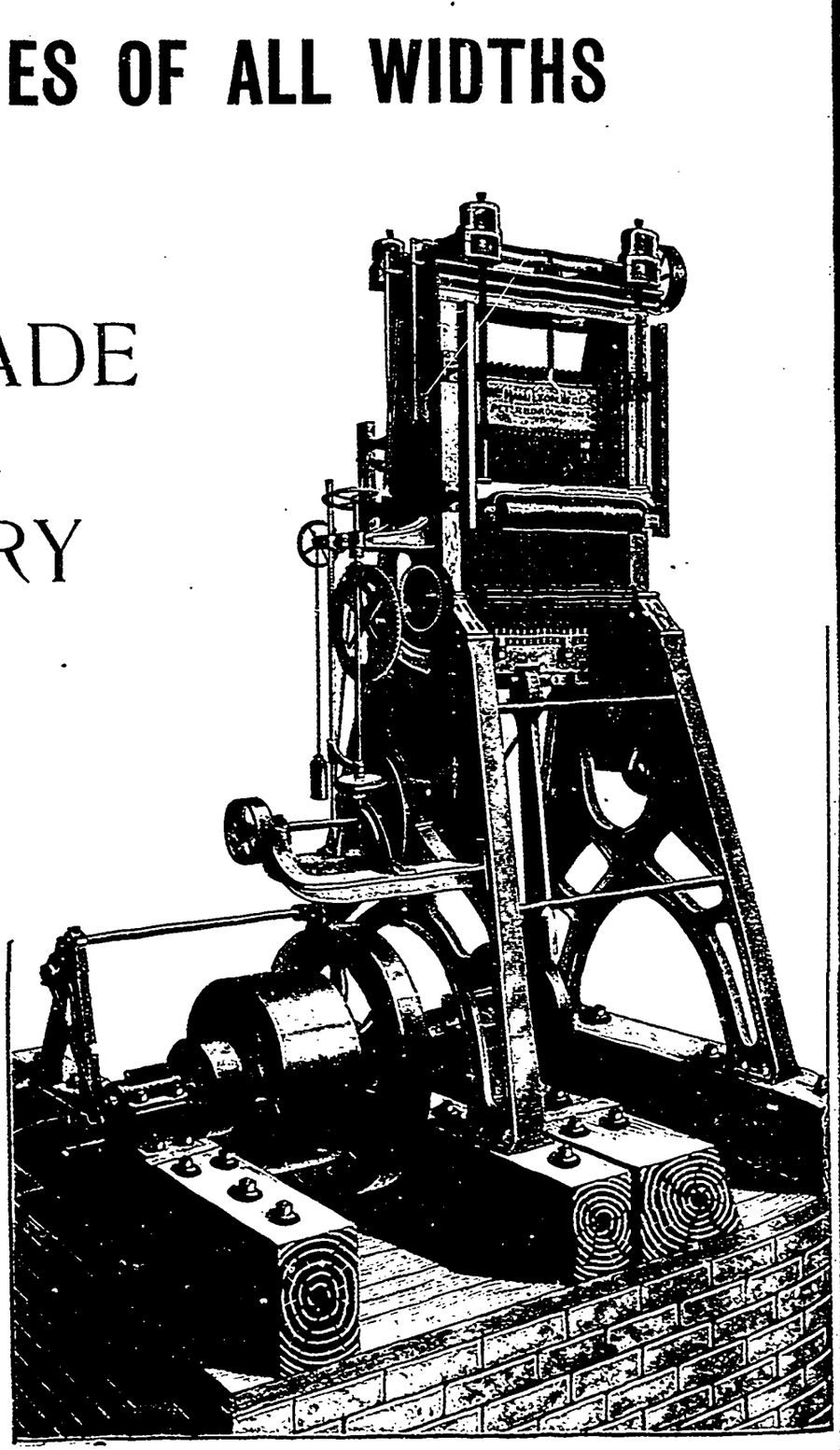

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THE CANADA LUMBERMAN

VOLUME XIX NUMBER 11 | TORONTO, CANADA, NOVEMBER, 1898 | TERMS, $1.00 PER YEAR. Single Copies, 10 Cents.

NOVA SCOTIA LUMBERING FIRM.

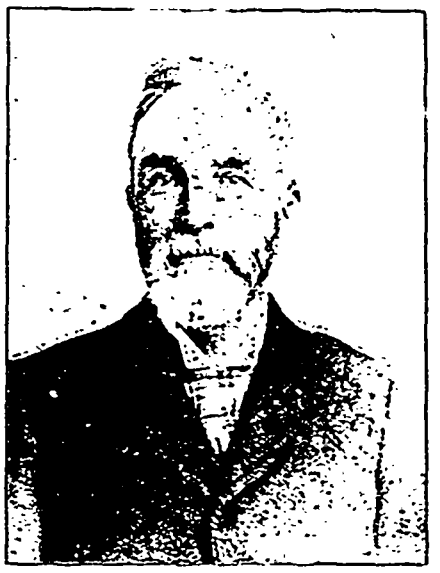
PROMINENT among the exporters of lumber in the province of Nova Scotia is The S. P. Benjamin Company, Limited, of Wolfville. This firm have a band saw mill at Falmouth, on the Avon river, about ten miles above the town of Windsor. It was built in 1896 on a large limit which the firm purchased tributary to the Avon river, and has a capacity of about five million feet per year. The firm pay particular attention to the South American and West Indian trade. The lumber from the mill is transported in a water sluice several miles to tide water, wh 't can be put on scows and taken to Hantsport for shipment. The mill is steam power, and was built completely by the Waterous Engine Works Co., of Brantford, Ont.

Messrs. Benjamin also have a water power gang and rotary mill at White Rock, a few miles from Wolfville, where until lately they carried on a lumber business of from four to five million feet per year. In both mills the company's present operations amount to about eight million feet annually All their lumber for export passes through the Basin of Minas into the Bay of Fundy. Mr. S. P. Benjamin, the president of the company, whose portrait we print, is a veteran lumberman, and perhaps no man in the business understands the conditions prevailing in the South American trade better than he. Illustrations of the two mills of the firm appear on this page.

THE SMALL MILL IN HARDWOODS.

IT is to some extent a disputed point whether hardwood lumber can be most satisfactorily made with a large or small plant. It is contended by some that to make good lumber you must have the best of modern tools- band saws, edgers, trimmers, and all the auxiliaries of a modern and first-class mill. Given an adequate supply of timber to keep such an outfit in operation long enough to enable it to pay for itself, and this position is likely to prove correct, but that it will apply to any great extent to hardwoods is open to question. It is exceptional that locations can be found for hardwood mills that are within easy reach of sufficient timber to justify the building of a first rate mill. Here and there it may be possible to find them, but, generally speaking, such locations are already occupied, and the possibility of finding other similar ones is very remote.

In point of fact, the bulk of the hardwood product has already come from the small mills, and there seems to be no reason now to doubt that it will continue to do so. The main reason



MR. S. P. BENJAMIN.

of this is that the growth of hardwood is everywhere so scattered that it is difficult to bring it to the mill so exceedingly difficult, indeed, that in most cases it is found cheaper to move the mill to the timber, and, as the near-by supply is cut out, to move it again within reach of the fresh stock. This is practicable, of course, only within the small mill ; hence the small mill is, and must continue to be, the chief reliance of the average producer of hardwoods.

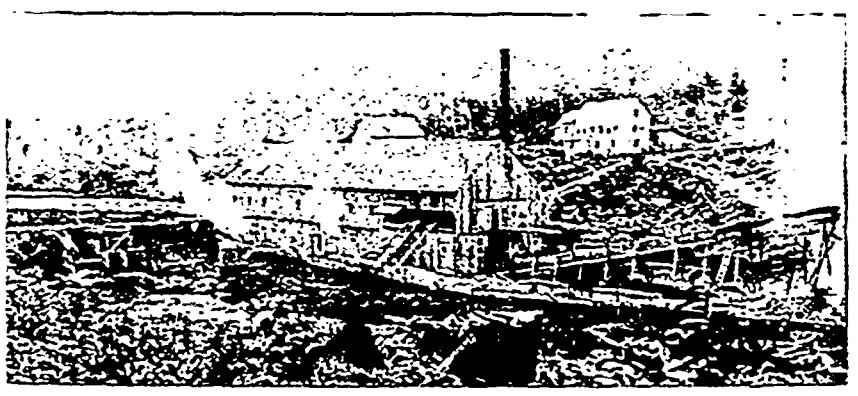
It is even likely that this tendency may make it hard for the larger mills now depending for a log supply upon the st' ams whereon they are located, to maintain their position as leading producers. The timber near to the streams is getting pretty well cut off, and as the loggers have to go each year farther and farther back to find trees suitable for their purpose, their hauling expense increases until it is even now becoming so heavy as to absorb all the profit there is in the operations. The obvious remedy for this is to move small, comparatively cheap mill plants into the woods, and manufacture the lumber there. Then only the marketable product needs to be hauled out, the mill culls, slabs and other waste remaining where it is made. It costs no more to haul lumber than logs, while the saving in avoiding the needless transportation of a vast bulk of useless material that must in the end be thrown away, amounts in itself to no mean profit.

Formerly the great objection to this method of operation lay in the difficulty of getting lumber decently manufactured with small circular mills, but that is fast disappearing, and complaints of bad sawing are not heard now to nearly the extent they were a few years ago. It is easier now to get good saw mills that will saw as evenly as any, and the business is getting to a greater extent into the hands of men who know that lumber must be well manufactured to sell to any advantage, and who therefore takes pains to have these mills operated by competent sawyers. Country sawed stock is, of course, not yet equal to the best output of first-class band mills, and it is not quite as economically produced, but it is in good enough shape to pass without complaint in the market, and it can be put there so much cheaper that, even allowing for a considerable percentage of extra waste, and possibly some slight difference in selling value, it can still show a large profit to the maker.- Hardwood Record.

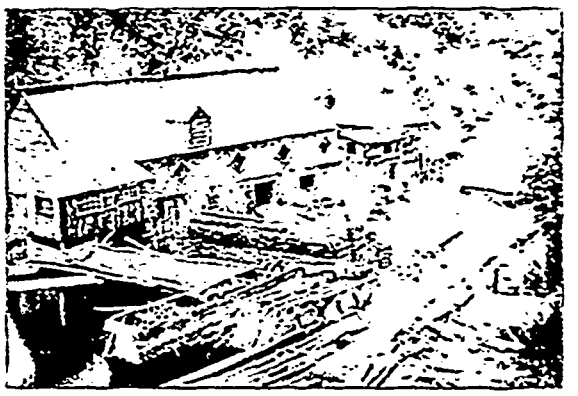
Mr. Ross Staples has recently started up a new saw and shingle mill at Franklin, Ont., adapted for cutting all kinds of hardwoods and heading.

Why does not some inventor wind up his thinking spring and bring out something which will supersede the drag saw? The roughness of the butts of shingles from blocks cut by such a saw is a great detriment, quotes a contemporary.

The total area of forests and woodland in Belgium is 1,223,568 acres. Of the forest lands 774,084 acres belong to private individuals, the rest to the state, municipalities or to public institutions. The average returns from the sale of lumber average $4,166,000.



BAND MILL AT FALMOUTH, ON THE AVON RIVER.



ROTARY AND GANG MILL AT WHITE ROCK.

SAW MILLS OF THE S. P. BENJAMIN COMPANY, LIMITED, OF WOLFVILLE, N.S.

Sea-Going Rafts on the Pacific Ocean

By EDWARD K. BISHOP.

IF some ship-builder of old, with the lines of his primitive vessel in mind, could survey the oceans now, he would doubtless be as much amazed at some of the strange craft putting to sea from the Columbia river as at the modern warships or ocean greyhounds. In truth, many builders well acquainted with the present systems of marine architecture and engineering would view for the first time such craft, while the layman might hesitate before deciding whether to pronounce them monsters of the deep or some freak in ship-building. They can hardly be classified as ships, even though designed to go to sea, or as barges, though great freight-carriers; they are, in short, huge rafts of round timbers or lumber, bound by cables, chains and bolts in a scientific and ingenious manner, the method of construction having been evolved after many experiments in this little-tried field.

For several seasons past rafts of logs have been towed to San Francisco, Cal., and the journey has been completed in safety a sufficient number of times to demonstrate that the method of transportation is practicable as well as profitable. This year rafts composed wholly of lumber, and of totally different construction, have made their appearance, and every one interested in lumber or the carrying trade on the Pacific coast is watching the experiments with great interest, as the establishment of this method of transportation would revolutionize the coastwise carrying-trade, and, by its great saving in cost, drive the sailing vessels and steam schooners out of business, or force a large reduction in charges.

Both log and lumber rafts are still looked upon as objects of curiosity on the Pacific coast, and more or less the projects of men who will take great risks. The former operates in a comparatively restricted field, and will probably never change existing conditions to any great extent, as many think the lumber raft is destined to do; but it has already stood the test of several seasons, and the methods of its construction will be treated first.

A CRADLE IN PROCESS OF CONSTRUCTION, BEFORE LAUNCHING.

Ten years ago considerable attention was directed to the first raft of logs ever built for an ocean trip. It was towed from the Bay of Fundy to New York city. Since then a number have entered that harbor, but at the present time the centre of activity in this line is on the Pacific coast of North America, where a company has been incorporated for the express purpose of transporting the timber of Oregon and Washington to San Francisco by means of rafts. The problem of incorporating material as unpromising as round logs into a vessel sufficiently stanch to make an ocean trip of 650 miles is a peculiar one, and few have seen the actual work of construction.

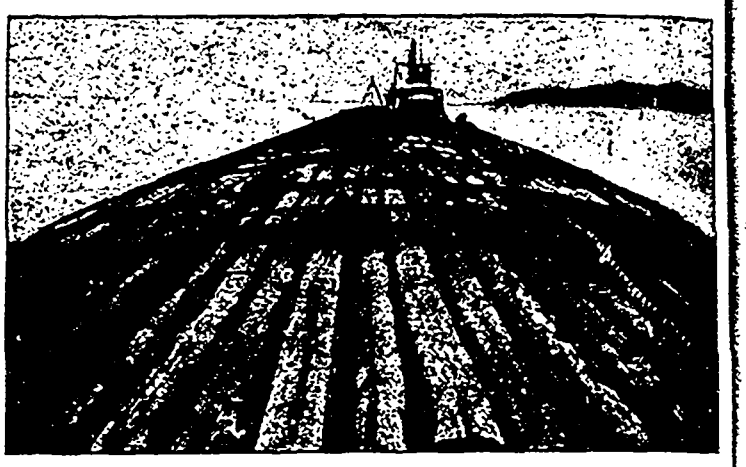
In contrast to ordinary boat-building, the cradle for this unique vessel is constructed on land and launched, leaving the work on the raft itself to take place in the water. The usual process of launching a completed vessel is replaced by drawing certain pins, causing the entire cradle to separate into two parts and allowing the raft to float freely in the river. At a short distance it then closely resembles one of the modern whalebacks, without any upper works, though a little closer inspection reveals the corrugated surface formed by the logs and the huge chains encompassing the whole. The timber composing it is of fir, and is chiefly for piling purposes and spars. No sticks shorter than 30 feet are used, and many measure 110 feet.

The cradle is composed of forty-three inverted bents, twelve feet apart, and the logs extend twelve feet over at each end, making the completed length 528 feet. The posts of the bents are 8 x 10 timbers; with caps, 10 x 20. The desired contour for the bottom of the raft is secured at each bent by 30° and 60° bearers, supplemented by gluts designed to produce a form as nearly circular as possible. The various bents are joined together longitudinally by a series of 12 x 12 timbers, or waling - 6 altogether, 4 being at the bottom and 1 on each side.

As already stated, the construction allows the final separation of the cradle into two parts, the line of cleavage corresponding closely to that of the keel of a boat. The division is rendered possible by the manner of joining the posts at each bent. One post is bolted to the 10 x 20, mentioned above, which extends the entire width at the point considered, while the other is fastened at right angles to an 8 x 10 and a 3 x 10, strapped together, with sufficient space left to allow the 8 x 20 to slide between, and long enough to reach half the distance between the posts. Thus it will be seen that the two sides of the cradle are entirely distinct, the connection being made by sliding one timber into the channel formed by the other two, and can be made into a rigid whole only by fastening the sliding member so that no motion is possible. This is done by pinning the three pieces together by a two-inch iron rod, so arranged that, when the raft is completed, power can be applied to withdraw each pin. Upon such withdrawal the cradle slides apart, releasing its burden.

When the cradle has been built and launched, it is towed to the desired location, which in the Columbia has been in fifty feet of water near the mouth of a slough, and is fastened in its place by a row of piling on one side, each pile passing through a tie box, connected with a bent, which allows the cradle to rise and fall with the tide and also to sink deeper as the load increases. When completed, the raft draws about twenty feet of water.

In order to bind the raft together, the constituent piling must be very carefully selected. No swell butts or crooked sticks are accepted. The minimum length of a pile is thirty feet, and the butt must not be less than twelve inches or more than 15 inches in diameter. Even with such timber, it is a source of wonder that a raft can be built to stand the ordinary swell of the ocean, not to mention the heavy seas frequently encountered, until it is noted with what care each piece is fitted into place, and the whole chained so that the pull on the towline actually binds it



A RAFT UNDER TOWAGE.

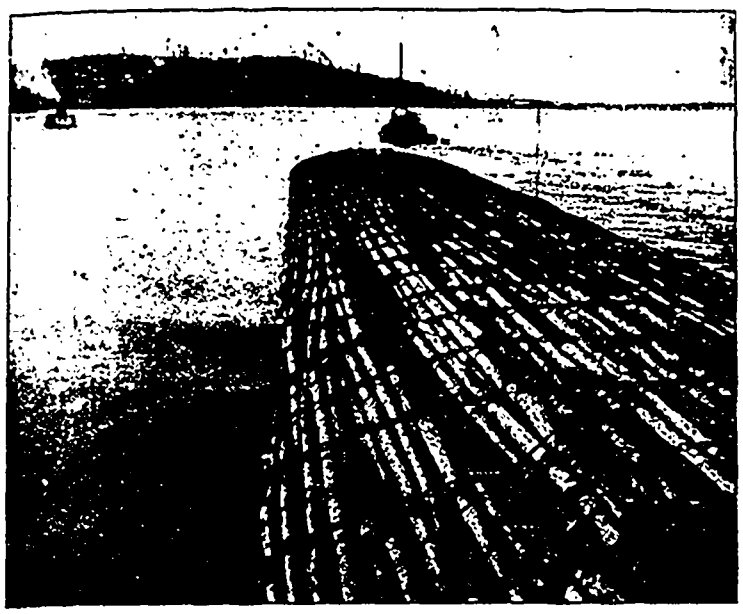
more firmly together. The logs are brought beside the cradle, where two large steam derricks, built on scows, are placed to hoist them into position inside. The raft grows, piece by piece, till the cradle is completely filled, when it is ready for the chain work which is to bind the whole together.

In form the raft closely resembles a cigar with each end cut off. It is designed that a section taken at any point should be a circle, but in practice most of the upper face is somewhat flattened. Each end is a perfect circle, twelve feet in diameter, and the size gradually increases till the width is fifty feet. After the raft leaves the cradle, its shape is maintained by chains, made of 1¼-inch iron, encircling the raft at intervals of twelve feet, and by wire cables running both longitudinally and transversely. The termination at each end is a stout bulkhead of four-inch plank, spiked to the ends of the logs. Outside of the plank are two upright round timbers, and the double cable, extending the entire length of the raft, joins the corresponding timbers together. The transverse cables connect the encircling chains a little below the water line, thus preventing the raft from spreading.

The method of connecting the towline to the raft is ingenious and effective. Through the exact centre extends a heavy chain of 1¾-inch iron, with a series of smaller chains attached at regular intervals and connected by shackles to those encompassing the raft. Near the middle these chains extend at right angles to the centre line, alternately on one side and the other, except in the case of the last five at each end, where the circumference of the raft is rapidly diminishing, these being arranged in even pairs and slanting sharply toward the bulkheads at the ends, in a regular herring-bone plan, before joining the outside bands. Thus, when a pull is exerted on the towline, it is transmitted to every chain encircling the raft, and the heaviest strain will come on the rear end, which can better stand it. The logs cannot escape, as they are bound by the circles of chain and the increasing diameter of the raft exactly as are the staves of a barrel when a

attempt is made to draw the hoops over the centre. The amount of chain used is about 80 tons.

The completed raft contains 450,000 lineal feet of timber, or in the neighborhood of 3,000,000 feet board measure. The average length of the piles is 55 feet, and the average diameter at the butt 14 inches. The spars are of special dimensions.

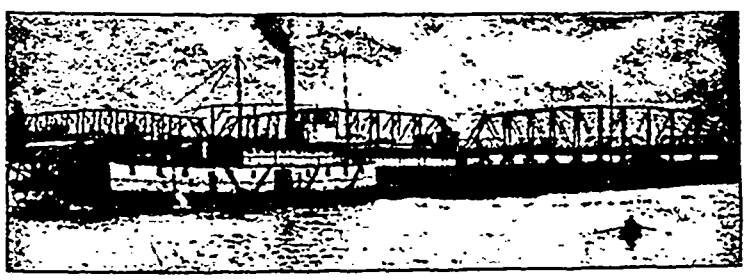


RAFT BEFORE ASTORIA, AT THE MOUTH OF THE COLUMBIA RIVER.

Auspicious weather is almost essential to a safe voyage of one of these unwieldy rafts, and they put to sea only at a time of year when storms are infrequent, though they successfully pass through weather much heavier than any that one would expect them to survive. In tow of an ocean steamer, the trip to San Francisco is made in about seven days. Several rafts have been taken out of Gray's Harbor, Washington, and this year will see the fifth start from the Columbia river. The first raft, in 1894, encountered a severe storm and went completely to pieces, but the succeeding ones reached their destination safely.

The shipping interests would gladly see the business discontinued, as there is always danger of several thousand logs being released on the face of the ocean—a great menace to the safety of vessels whose course lies in their vicinity. The risk which the owners assume when they put many thousands of dollars into such a venture will be more potent in keeping the number of rafts from becoming large than the fears of captains; but the method of transportation is so economical that doubtless considerable quantities of the piling used in the neighborhood of San Francisco will find its way there in this form.

Captain Robinson, who was interested in the first raft of logs built on the Bay of Fundy, and who is in charge of those constructed on the Columbia river, has patented his methods of building the cradle and of placing the chains.



LUMBER RAFT LEAVING PORTLAND, OREGON, IN TOW OF A RIVER STEAMER.

The first raft of lumber built to make the sea journey to San Francisco was constructed at Portland, Oregon, by Inman, Paulsen & Co., and left the Columbia river June 24, 1898, in tow of two tugs. It encountered a storm, and the wind, blowing at the velocity of seventy miles an hour, finally produced a sea which broke the raft in two. The fragments held together for two hours after the back of the raft had been broken, and finally one tug towed the forward part into the harbor of San Francisco, while the other succeeded after a time in picking up the remaining portion and towing it to the same port in safety. Only a tenth of the lumber was lost.

The raft which started in June contained 5,000,000 feet of lumber, and was 396 feet long by 53 feet wide. It is difficult to realize the immense quantity of material incorporated into this raft, though a comparative idea may be gained by considering the fact that the average capacity of large ocean vessels is little more than 1,000,000 feet. Portland already has the distinction of loading the largest cargo of lumber that ever left the Pacific coast, which was won last year when the Glenlochy took 3,000,000 feet of railroad material to Siberia. Now, to pile Pelion on Ossa, the new rafts appear.

The idea of shipping lumber in this way originated with Johan Paulsen, a prominent lumberman, whose attention was attracted to the subject last winter by the difficulty of securing vessels to take lumber to San Francisco, owing to the fact that the majority of those available had entered the Klondike and Alaska trade. Doubters scoffed at the idea of transporting lumber in such a form, but the long years spent by Mr. Paulsen in the lumber business had included experience in rafting on eastern rivers and lakes, as well as on the Baltic; so, after looking at the project from a scientific standpoint and carefully considering all the difficulties connected with it, he concluded that a method of construction suited to an ocean trip of seven hundred miles could be evolved.

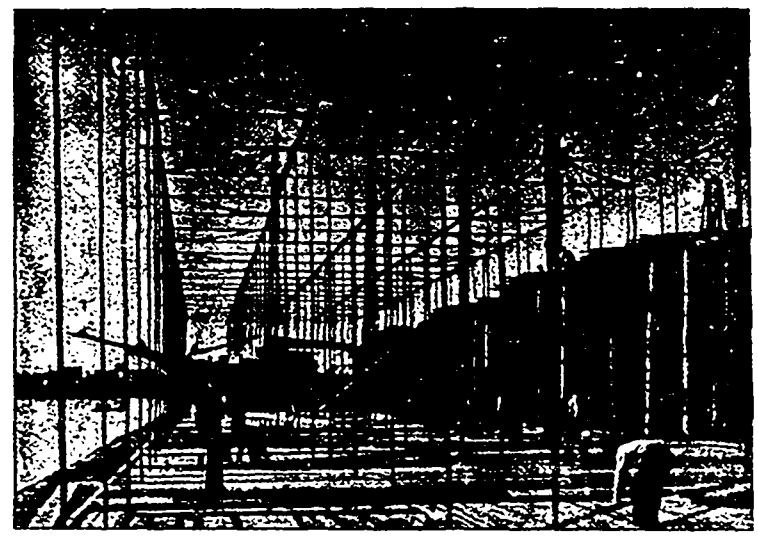
The raft projects very little above the surface of the water, and this greatly increases its chances for a safe trip, as the waves wash completely over it, encountering little resistance, instead of expending their force in battering it to pieces. This is a principle used in the construction of the famous whalebacks, and one which experience has proved to be valuable.

The first step in constructing this late arrival among the various types of marine architecture is to select a dock, or drive a line of piling, 400 feet long, as the basis of the work, and to supply a straight edge for the side of the raft. A stringer, or what might be termed a keel, is built for the entire 400 feet by fastening together five layers of two-inch plank with ends butted so as to ensure the greatest strength. Five of these stringers are made, and placed something like huge joists, ready for a floor, and are then planked over crosswise, making an immense platform 396 feet long and 53 feet wide. The bottom of the raft is now made, and the next step is to pierce each stringer, or joist, at intervals of 12 feet, and insert a long and heavy wrought-iron bolt, fitted with washer and nut below, certain planks being left loose up to this point, to allow their adjustment. The platform, which at first looked like a large dancing floor, is now so changed as to resemble an orchard with long rows of spindling trees. The purpose of these rods can be seen after the lumber is put in.

First, a layer of lumber is placed lengthwise; next, another crosswise; and so on, till a pile 21 feet deep is made, the raft gradually sinking as the load becomes heavier, and about a third projecting above the surface all the time. The rods serve to connect the bottom and top, and bind the mass into a homogeneous whole.

A very liberal factor of safety is allowed, as the aggregate strength of the 170 rods would support a weight of 25,000,000 pounds, while the weight of the completed raft is only 15,000,000 pounds out of water, and much less when submerged. The completed raft is encircled lengthwise by a 1¼-inch cable, to furnish a secure hold for the towline. The cable is of plow steel, and its strength is equivalent to that of a 14-inch hawser.

Before construction was commened, a prominent marine underwriter was approached in regard to insurance. He admitted that the danger of loss was not nearly as great as many people would suppose, but predicted that the promoters of the project would encounter difficulty in insuring the raft, because it is so radical a departure from the orthodox methods of transportation, and because, if successful, it would have a far-reaching effect upon the lumber-carrying trade on the coast. Mr. Paulsen has applied for patents on his novel lumber carrier, and he expects his raft to occupy a place beside the whaleback, which was at first an object of ridicule. An important feature in the construction of the raft is that only an insignificant percentage of the lumber is injured by nail or bolt holes, and even this can be utilized for firewood in California.



ARRANGEMENT OF BOLTS AND METHOD OF PLACING LUMBER IN RAFT-BUILDING.

One of the principal objections brought against rafting is the probable staining of the lumber by immersion in the muddy current of the Willamette river and the salt water. Many claim that the concession in the price of the lumber which will have to be made on this account will balance the saving in freight charges, and say that at best only low-grade stuff can be so shipped to advantage.

Rafting of this kind is still in the experimental stage, and it is early to predict the ultimate result; but, as this method of transporting lumber is only about half as expensive as the old, it is safe to assume that there will be a strong effort to make it a permanent success, and that the lumber trade of California and the Pacific northwest of America is likely to feel the effect of sea-going rafts.—The Engineering Magazine.

The American Monthly Review of Reviews for November makes an interesting assemblage of "Roosevelt cartoons," apropos of the Colonel's candidacy for the governorship of New York.

NOTES ON BELTING.

Tests of Leather, Rubber, Cotton and Other Belts.

By G. R. MacLeod, McGill College, Montreal.

FOR transmission of power by belting various materials are used. Among the most important are: Leather, rubber and cotton belts.

The material considered most favorable for belting is probably leather. It is very efficient and wears well, but is more expensive than rubber or cotton. In certain situations where it would be exposed to moisture, great heat, etc., its efficiency and durability are reduced.

Another weakness is that it must necessarily consist of short strips of about five feet in length, joined in various ways, which will be noticed later. The belt is therefore subject to failure in as many places as there are joints. Some methods, however, make the joints almost as strong as the solid leather, but the presence of the joint may cause the belt to fail, not from tension, but from a tendency to wear or crack at that point.

The best belts are made from oak-tanned ox-hide, the strongest part of the hide being the back. The belt can be made in long strips by taking a wide disc of leather and cutting it in a spiral direction. The strip thus cut is stretched taut and rubbed to make it straight. From a disc 4 ft. 9 in. wide a strip over 100 feet long of 2 inch belt can be made. If greater width is desired several strips can be sewn together side by side. A double belt of this kind has been used 75 inches wide and over 150 feet long.

The grain or hair side of the leather is put next the pulley. It would appear at first sight as if this were a mistake, since the grain side is the smoother and would therefore give less friction.

Mr. Arthur Archard, of Geneva, in a paper before the Institute of Mechanical Engineers, 1881, says:

"If the belt is wide, a partial vacuum is produced between the belt and the rim of the pulley, by the aid of an adequate velocity which causes the atmospheric pressure to press the belt close against the pulley; an adhesion is thereby produced which is totally independent of friction, and enables the tensions to be considerably reduced." This is very important, because the less the tension on the belt, the less will be the friction on bearings, and, hence, the greater power derived. A wide, thin belt is therefore better than a narrow, thick one, and this is so not only for the reason that it gives less tension on the belt, but because it also gives greater flexibility.

Mr. D. A. Low, in his Machine Designing, also states that the smooth side is the better "because it gives greater driving power," reasoning probably in the same way as Mr. Achard.

Mr. J. Tullis, of Glasgow, however, states that the belt will last longer if the grain side is out, and that coatings of curriers' dubbin and oil will make the flesh side as smooth as the other. All writers seem to agree that the adhesion of the belt to the pulley depends very little, if any, on friction, and that, therefore, a rough surface is more injurious than useful.

Rubber belting is superior to leather in damp places. The part of the belt that gives it strength is not the rubber, but the cotton framework.

It is made by taking a wide strip of cotton duck and folding it into as many plies as desired, with rubber in between, with a thicker coating of rubber on the outer side.

The rubber is in a liquid state when applied to the cotton, and when the belt is finished it consists of a strong, solid, flexible belt, having the appearance of solid rubber. There is almost no limit to the length that can be made in one piece, so that there is only one joint in any piece of belt in use. Even this can be avoided by ordering an endless belt for special cases. The manufactured product is usually very uniform in quality. Extremes of heat and cold have very little effect on it, and it has very little tendency to slip on the pulley. It should be kept free from all animal oils or grease, as these are injurious to the rubber. Rubber belting seems to be especially adapted for such purposes as elevators, for railways, pulp mills, mines, etc.

Cotton, that is cotton without rubber or any other material, makes an excellent belt. It can be made stronger than leather of the same cross-section, and of great length without joints. It is better than leather in moist places, and is less expensive. It was formerly made in the same way as cotton and rubber belting—that is, by laying one ply of cotton duck on top of another till the desired thickness was attained, and then sewing the whole together The more modern method is to make the whole thickness together at one operation, each ply being interwoven with the one next to it. The process of manufacture is rather complicated, but this does not make the belt expensive.

An improvement on the plain cotton belt is made by soaking it in a mixture of red lead and linseed oil. This process has the same effect as it has in preserving wood. The cotton belt is then more efficient in moist places or in conditions which are found very unfavorable to the use of leather or even rubber. Some modifications of this kind of belt are made by substituting for part of the cotton a woof of hair and other materials. An example of this is the "Camel Brand," tests of which are reported below.

Gutta percha has been used as a substitute for rubber, and has been found to be a good protection to the cotton. A special brand of this, called "Balata Belting," was tested. It is manufactured in England, and has a rather thick coating of gutta percha on the outer side, and thin layers between the layers of cotton, while the side next the pulley is coated with a solution called "Balata."

STRESSES IN BELTS.

Belts are subject to two kinds of stress, viz., tension and bending, but the most serious strain is caused by bending round the pulleys. If the pulleys are small, the only way is to use the most flexible material. This will probably be the cheapest in the long run.

A good rule is given by Lineham in his Mechanical Engineering, viz., the distance from centre to centre of pulleys should not be less than six times the diameter of the larger pulley.

A most important matter is that the edges of the belt should wear well. If the edge is not good it will soon become frayed by contact with the rim of the pulley, and will cause failure of the belt. The best edges that the writer has seen on any belt are on good oak tan leather, and on rubber. The structure of the latter (folding), together with a strong covering of rubber, secures a good, compact edge.

Belts of paper have been made and used in the United States with success. They are very strong and durable if not exposed to moisture, and they stretch very little while at work.

So far nothing has been said with regard to stretch of belts under tension. This will be treated along with the results of the tests.

Creep in belts is due to the belt stretching on the tight side. If the belt stretches easily this is very serious. For every foot of belt that goes on the driver less than a foot goes off and goes on to the follower. If the diameters of the pulleys were equal the driver would make a greater number of revolutions in unit time than the follower would. Hence, if there is much stretch in the belt there is a loss of speed. This loss amounts to 1 per cent. to 3 per cent., depending on the elasticity of the belt; since the tension on the belt is kept as low as possible to prevent too much friction on bearings of the pulleys, the belt that is least extensible at low tensions is the one which is most valuable in this respect.

JOINTS AND FASTENINGS.

Joints form the weak feature of belts, so far as tensile strength and wear are concerned, especially in the case of leather belting. They are of two kinds, (a) permanent, (b) temporary.

Permanent joints take many different forms. In leather belting the most common is the laced joint (Fig. 1.) A lap-joint splice is made and cemented together; then two or three rows of rawhide lacing is put in. The holes for the lacing are not punched, but two sharp cuts are made for each stitch. The cuts should lie diagonally so as to injure the longitudinal fibres as little as possible.

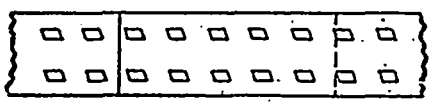


FIG. 1.

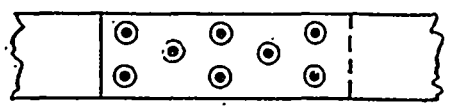


FIG. 2.

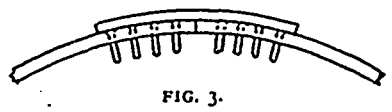


FIG. 3.

FIG. 4.

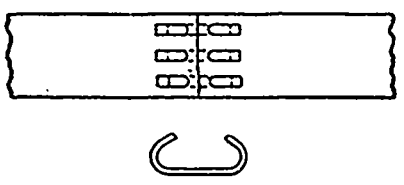


FIG. 5.

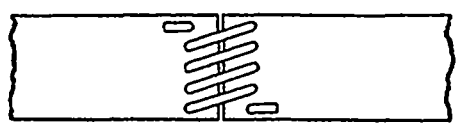


FIG. 6.

FIG. 7.

FIG. 8.

FIG. 9.

Copper riveting is used as a substitute for lacing, the belt being spliced, as before, and a number of rivets inserted (Fig. 2.) This joint shows a tendency to break across a row of rivets, and is only about two-thirds the strength of the solid belt.

Harris metal plate fastener (Fig. 3) consists of a slightly curved plate, same width as the belt, with a number of spikes. The belt is cut with square ends, and the spikes are driven first through one piece and then the other. As the plate is curved and the spikes are perpendicular to it, they take a good firm grip on the leather. The spikes are clinched after connection.

In Lagrelle's fastener (Fig. 4) the ends of the belt are cut square and bent up. Strips of steel or iron are run through the holes cut for the purpose, each strip having two eyes to hold pins. These pins run through strips at each end, and form a wide link. In fasteners such as this the strain is distributed over the width of the belt, and there is also not the same tendency to cut through in front of the holes as in many other kinds.

TEMPORARY FASTENINGS.

The fastener shown in the accompanying sketch (Fig. 5) consists of a curved strip of iron. The ends of the belt are cut square and holes are made to receive the fastenings, which are inserted and hammered flat.

Laced Joints. There are many forms of laced joints. The simplest is shown in Fig. 6.

Fig. 7 is the same joint as Fig. 6, but double laced.

Fig. 8 is a double laced joint with only one strand in each hole.

In the joint shown in Fig. 9 the holes are staggered, there is only one strand in each hole, and the strands do not cross on each other.

These are the commonest forms. Fig. 6 has hardly enough lacing; Fig. 7 has twice as much lacing as Fig. 6, but concentrates all the stress on a single row of holes. Joints like Fig. 8 and Fig. 9 give about the greatest possible strength of lacing.

The holes for the lacing are usually round punched. Awl holes are not so good. D. A. Low, Machine Designing, says that the holes should be oval punched, and should have the long diameter parallel to the edges of the belt. And on the face next the pulley the lacing should be as nearly parallel to the edge as

possible. It is also better if the lacing does not cross on itself.

Double belting, generally speaking, is not so good as single, since flexibility is what is required. It has been found, however, in certain cases, such as the belt for a return saw, that a double belt wears best, being better able to stand the alternate stretching and buckling.

RELULTS OF TESTS.

Tests of belting were made in McGill College testing laboratory in 1896-7 on the Emery testing machine. When pressure from the accumulator is admitted gradually the diagram curve of extensions is quite smooth and regular, but when the machine is fed rapidly the extensions are less; this becomes more noticeable in belt testing. It shows as a sharp change in the curve, but when the feed is again better regulated the curve resumes its former course. In some cases these sharp changes in the curve may be due to lack of uniformity in the material, particularly in the case of belting composed of cotton and hair. Extensions were read at every 200 pounds increase of load, except in some of the larger specimens, where readings were taken every 500 pounds increase.

Leather Belting.—Specimens were procured from a dealer in Montreal.

NO. 1.—ENGLISH OAK TAN LEATHER.

Width, 2 in. Sectional area, .453 square in.
Weight, .213 lb. per lineal foot.
Cost, 23 cents per ft.
Total stretch in 24 in. was 2.15 in.=9 per cent.
Permanent stretch, 0.2 per cent.
Maximum strength, 2,210 lbs. per square in.

This specimen contained a spliced cemented joint and laced in the same manner as first example described under "Joints." It broke straight across the middle of the joint.

No. 2.—(Same belt as No. 1, but without joint.)
Maximum strength, 4,640 lbs. per square in.

This shows that the strength of the joint is about one-half the strength of the solid belt.

NO. 3 —HEMLOCK TAN LEATHER.

Width, 3½ in.
Sectional area, .798 square in.
Weight, .206 lbs. per ft.
Cost, 43 cents per ft.
Total extension was 3.11 in. in 18 in.=18.3 per cent.

This specimen has a cement splice without lace or rivets. It failed at 3,300 pounds per square inch.

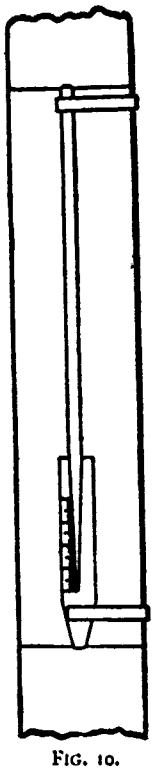


FIG. 10.

Fracture took place, not in joint, but immediately at its edge.

A solid piece of this belt stood 4,000 pounds per square inch.

An unlaced cemented joint is stronger than a laced one, but lacing is necessary where the belt is exposed to heat or moisture.

RUBBER BELTING.

The specimens tested were manufactured by a Canadian company.

The curve of extensions is almost a straight line with a slight tendency to turn upwards immediately before fracture. This straight line indicates that the extensions are about the same for each increment of load, and hence that the material is very uniform. Another fact that shows the uniformity of the material is that the fracture in each case was clear and straight across the belt. It was not a tear but a break.

The method of measuring the extensions is shown by Fig. 10. Two pencil lines are ruled square across the belt exactly thirty inches apart. A scale graduated to hundreths of an inch is clamped with one end at the lower mark.

A long steel pointer is clamped at the other mark. As the belt stretches this pointer moves along the scale, thus giving the amount of stretch, which can be read in hundredths.

Fig. 11 shows the method of holding the specimen. A piece of steel rod a is placed in the loop of the belt, to take up the pressure from the two rods bb, whose section is a semi-circle; bb are fitted into grooves and are free to move, so that the pressure from them is always directed towards the center of a. A separate piece of belting c is placed between the jaw and the specimen to protect the latter from being cut by the jaws. Four bolts d are used to tighten the jaws. When the belt stretches its thickness is diminished. The bolts are then tightened more to prevent slipping. The jaws are connected to the piston of the ram by a ball and socket joint. They can thus adjust themselves to any unevenness in tension.

SPECIMEN NO. 1.

Width, 4 in. Sectional area, .84 square in.
Weight, .4768 lb. per lineal ft.
Cost, 42 cents per ft.
Broke at 4,170 lbs. per square in.
Total extension in 30 in. = 3.00 in. = 10 per cent.
Permanent extension, 0.13 per cent.

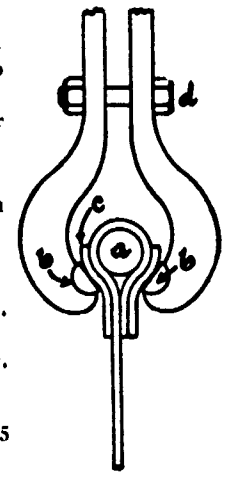


FIG. 11.

SPECIMEN NO. 2.

Width, 5 in. Sectional area, 1.1 square in.
Weight, .635 lb. per lineal ft.
Cost, 52 cents per ft.
Broke at 4,270 lbs. per square in.
Total extension, 14.9 per cent.
Permanent stretch, 3.0 per cent.

SPECIMEN NO. 3.

Width, 6 in. Section, 1.505 square in.
Weight, .844 lb. per lineal ft.
Cost, 62 cents per ft.
Broke at 3,790 lbs. per square in.
Total stretch, 16.4 per cent.
Permanent stretch, 3.0 per cent.

SPECIMEN NO. 4.

Width, 8 in. Section, 1.92 square in.
Weight, 1.032 lbs. per ft.
Cost, 84 cents per ft.
Broke at 3,700 lbs. per square in.
Total stretch, 17.0 per cent.
Permanent stretch, 1.9 per cent.

SPECIMEN NO. 5.

Width, 10 in.
Weight, 1.1434 lbs. per lineal ft.
Cost, $1.07 per ft.
Maximum load, 3,320 lbs. per square in.
Total stretch, 13.9 per cent.
Permanent stretch, 1.6 per cent.

SPECIMEN NO. 6.

Width, 12 in.
Weight, 1.2806 lbs. per lineal ft.
Cost, $1.30 per ft.
Maximum load, 3,540 lbs. per square in.
Total extension, 14.5 per cent.
Permanent extension, 2.4 per cent.

SPECIMEN NO. 7.

Width, 14 in.
Weight, 1.812 lbs. per ft.
Cost, $1.54 per ft.
Maximum load, 3,620 lbs. per square in.
Total extension, 15.8 per cent.
Permanent extension, 2.0 per cent.

CAMEL BELTING.

This belting is made partly of cotton and partly of coarse camel hair, said to be the combings of camels. The cotton is the material which forms the chief strength and therefore the longitudinal fibres are cotton. The hair yarn forms a woof, although in some of the specimens tested there were strands of hair running longitudinally as well as transversely. The two materials being interwoven in several plies, the belt is soaked in red paint and allowed to dry. The paint forms a good body coating, which protects the belt from moisture and makes it very durable. To prevent the belt from becoming stiff and hard an occasional coating of castor oil and tallow should be applied; but any resinous mixture is injurious. In making the lace holes a sharp awl should be used instead of a punch, as the latter cuts the threads and thus weakens the belt.

SPECIMEN NO. 1.

Sectional area, 4.35" × 29" = 1.262 square in.
Weight, .5717 lbs. per ft.
Cost, 33 cents per ft.
Total extension, 21.9 per cent.
Permanent extension, 11.6 per cent.
Maximum load, 5,960 lbs. per square inch.

SPECIMEN NO. 2.

Section, 5.07" × .24" = 1.22 square in.
Weight, .599 lb. per ft.
Cost, 39 cents per ft.
Total stretch, 35.1 per cent.
Permanent stretch, 4.45 per cent.
Maximum load, 5,570 lbs. per square in.

SPECIMEN NO. 3.

Section 6.1" × .28" = 1.71 square in.
Double or "Russian Brand."
Weight, .7995 lb. per ft.
Cost, $1.00 per ft.
Total extension, 24.5 per cent.
Permanent extension, 7.1 per cent.
Maximum load, 5,900 lbs. per square in.

SPECIMEN NO. 4.

Section, 5.95" × .22" = 1.31 square in.
Weight, .599 lb. per ft.
Cost, 48 cents per ft.
Total stretch, 27.6 per cent.
Permanent stretch, 12.9 per cent.
Maximum load, 5,650 lbs. per square in.

SPECIMEN NO. 5.

Section, 6.1" × 30" = 1.83 square in.
Weight, .781 lb. per ft.
Cost, 58 cents per ft.
Total stretch, 20.6 per cent.
Maximum load, 5,360 lbs. per square in.

SPECIMEN NO. 6.

Section, 12.20" × .31" = 3.78 square in.
Weight, 1.705 lbs. per ft.
Cost, $1.33 per ft.
Total stretch, 38.0 per cent.
Permanent stretch, 19.3 per cent.
Maximum load, 5,160 lbs. per square in.

A glance at the curves shows that for small loads the extensions are uniform and even have a tendency to decrease until a certain limit is reached. The elastic limit comes much sooner than in rubber and leather, and there is an enormous extension at the ultimate strength.

The ultimate strength is much greater than that of rubber and leather, etc., but the belt would never be used in such high tension.

PATENT "BALATA" BELTING.

This kind of belting already described seems to be very good. It is very strong, and the amount of stretch is small.

The gutta percha is said to bend over small pulleys with more ease than rubber, and it is also claimed it resists heat and moisture better. It has cheapness in its favor, and is likely to become a popular belt. Only one specimen was tested:

Section, 4.45" × .22" = .979 square in.
Weight, .433 lb. per ft.
Cost, 46 cents per ft.
Total stretch, 15.7 per cent.
Permanent stretch, 4.4 per cent.
Maximum load, 5,210 lbs. per square in.

Table showing comparative value of belts:

Kinds of Belts.	Ultimate strength. Per Square In.	Ultimate strength. Per Lb. per Ft.	Total Stretch.	Stretch at 400 Lbs. per Square Inch.	Permanent Set.
Leather.....	4,320	12,200	16.5 to 18.3	1.0%	0.5%
Rubber.....	3,773	7,290	14.6%	2.2%	2.0%
"Camel".....	5,860	12,150	29.6%	2.2%	13.1%
"Balata".....	5,210	11,750	15.7%	1.6%	4.4%

The column "Strength per lb. per ft.," gives a fair idea of the proportionate driving power that can be got out of the same weight of different kinds of belt.

The last two columns show the comparative values with regard to stretch.

PRICES.

Leather ..... 16 cents per ft. for 1" belt, to $12.00 per ft for 72"
Rubber ..... 21 cents per ft. for 2" belt, to $6.72 per ft. for 52"
"Camel"..... 12 cents per ft. for 2" belt, to $1.33 p r ft. for 12"
"Balata"..... 21 cents per ft. for 2" belt, to $1.50 per ft. for 12"

The "Camel" belting is by far the strongest, but its stretch is greatest. Where it can be used, the leather is probably the most economical, although it is very expensive in large widths. It is the lightest, and less power is lost by stretch.

The gutta percha comes next for lightness and driving power, and would therefore seem to be the most serviceable belt of all. But it is hardly fair to come to such a conclusion when only one specimen was tested.

CANADA LUMBERMAN
WOOD WORKERS' MANUFACTURERS AND MILLERS' GAZETTE

MONTHLY AND WEEKLY EDITIONS

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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.

Especial 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 on 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 25 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.

LEGALITY OF THE MANUFACTURING CLAUSE.

THE International Commission sitting at Quebec adjourned early last month, to again convene, at Washington, on the tenth of November. Meantime, the interest surrounding the timber question has not relaxed, but rather more vigorous efforts have been put forth by those concerned to make such representations as will be likely to accomplish their desires.

The most recent and important feature of the controversy is a memorandum issued by Hon. Mr. Hardy, Premier of Ontario, bearing upon the constitutionality of the clause compelling home manufacture of timber. The statement is a concise review of the situation, and seems to show clearly that the action taken by the Ontario government was within their powers. After pointing out that the timber licenses are granted subject to such conditions as may be imposed by the Crown, Mr. Hardy quotes the British North America Act assigning to the province jurisdiction over the timber lands. As to the power of the Dominion government to disallow the act, it is contended that this should not be exercised except in the case of acts which are illegal or unconstitutional, or which affect the interests of the Dominion generally. This is the principle on which the Federal government acts in relation to disallowance of provincial legislation, and to interfere with the present law would be contrary to all precedent.

Mr. Hardy also treats the question from the standpoint of forest preservation in a manner which is in keeping with the prevailing feeling in Canada. The unwise policy of the state of Michigan has resulted in the depletion of her forests, forcing the lumbermen to seek raw material in Ontario. While our forests are now extensive, a comparatively short time only would elapse before the Michigan lumbermen, if given free access to our forests, would exhaust the timber supply adjacent to the Georgian Bay shore.

The Ontario government, at the command, we may say, of the people, have taken up the weapon to protect Canadian industries and Canadian lumbermen. They have announced a policy to which they will adhere, only swerving therefrom in consideration of the concession which has been asked, namely, free lumber for free logs.

Recent events give strong encouragement to Canada to conserve her forest wealth instead of permitting logs and pulp wood to be exported to the United States. The proposed establishment of pulp and paper mills at Sturgeon Falls, Ontario, at a cost of one million dollars, is in itself particularly significant of possible development. There is every indication of a large and healthful growth of the wood industries of this country.

THE MONTREAL, OTTAWA AND GEORGIAN BAY CANAL.

THE project to construct a canal uniting the waters of Lake Huron with those of the St. Lawrence river via the Ottawa river has received some encouragement of late, and it can at least be said that there is a reasonable prospect of the undertaking being carried out in the near future. The report of the special committee of the Senate of Canada upon the feasibility and advantages of such a waterway has been distributed. In this facts are presented which would certainly seem to justify the government in giving such assistance to the scheme as would secure its early completion.

The cost of the construction of the canal is estimated at $17,000,000, and the Dominion government is asked to guarantee two per cent. on that amount for a period of twenty years, which would be $340,000. But the promoters claim that the canal would pay almost from the time it is completed, thus reducing the responsibility of the government. For the purpose of safety, however, it would be well to assume that assistance to the extent of $340,000 annually would have to be given for twenty years. The question then is, would the advantage to the country be sufficient to warrant the expenditure?

No one will dispute that the lack of direct water communication between Lake Huron and the St. Lawrence has affected commerce and retarded the development of the northern section of the province and of western Canada. Owing to the great distance, the existing water route from Sault Ste. Marie, via Lake Huron, Lake Erie, Welland Canal, Lake Ontario and the St. Lawrence river to Montreal, cannot be employed with profit for the transportation of many classes of goods. By the construction of the proposed ship canal, a natural outlet would be provided for immense quantities of grain, timber products and general merchandise. It would open up new timber lands, and give an impetus to the establishment of pulp mills.

The advantage of the Ottawa route is well illustrated by the saving in distance between western lake ports and ocean navigation. From Chicago to Montreal the distance via the St. Lawrence is 1,290 miles, and via the proposed ship canal 950 miles—a difference of 340 miles. From Duluth there is a like saving of 340 miles. It will thus be seen that grain from Lakes Michigan and Superior could be laid down in Montreal at a lower rate of freight, and much trade that now goes by way of the Erie canal would be diverted to Canadian ports.

The feasibility of the undertaking has been favorably reported upon by eminent engineers, and the work will, it is believed, involve no physical difficulties. The distance from the mouth of the French river, on Lake Huron, to Montreal, is 430 miles. Of this distance 351 miles are already a perfect natural navigation, requiring no improvement, while it is said to be practicable so to improve the remaining 79 miles as to convert the chain of waters into a first-class navigation highway for vessels. The length of canalling, exclusive of the Lachine canal, would be about 21 miles.

The project is one of such magnitude that it could scarcely be expected to be undertaken by private capital, and the great commercial advantage likely to accrue to the trade of Canada would, we think, justify the government in guaranteeing the money asked to ensure its construction, which would be a boon to the lumber industry of this country.

EDITORIAL NOTES.

THE question may be asked as to the extent to which the axe is likely to be superseded by the saw for cutting down trees in connection with lumbering operations. A partial answer to this is found in some correspondence received from the Maritime provinces, in which it is stated that a number of the lumbermen have discarded the axe entirely, and are now using the saw for cutting down the timber. Considering the saving of timber thus effected, which is estimated at from five to ten per cent., it is rather singular that the saw has not been more generally adopted for this purpose. Another advantage claimed is, that when the men become accustomed to using the saw, they can accomplish a greater amount of work in a given time.

SIMULTANEOUSLY with the publication of this number, a meeting of the National Hardwood Lumber Association is being held in Cincinnati, the desired outcome of which is to secure the adoption of a uniform set of grading rules for all the hardwood markets of the United States, or, failing this, for as many of them as possible. Efforts are being put forth to have a representative meeting of both manufacturers and wholesalers. It will be remembered that the National Hardwood Lumber Association was organized in May last, and adopted a set of rules. These do not appear to have given satisfaction, and it is now proposed to make some desired amendments with a view to their more universal adoption. We learn that throughout Ontario much interest is taken in this movement, owing, of course, to the quantity of hardwoods marketed in the Eastern States. It is earnestly hoped that, by the action of this association, the lumbermen of Ontario will be sufficiently aroused

from their legarthy to follow in the footsteps of their neighbors. Just as certain as uniform grading rules are required in the United States, are they likewise a necessity in Canada, and particularly in Ontario, where hardwoods are found in greater abundance than in the other provinces. It would also seem a less difficult task to frame rules that would apply to the various districts of Ontario than to the extensive markets of the United States.

The final report of the Ontario Forestry Commission appointed last year will be presented at the coming session of the provincial legislature. The Commission will then have fulfilled its duties, so far as its present appointment is concerned. Taking, for guidance, the preliminary report submitted last December, we have reason to anticipate a volume of information and recommendations of very great value. The early work of the Commission was much along the line of ascertaining the reproductive qualities of white pine, the results of observation and investigation being of the most encouraging nature. In the final report the question of reforestization will no doubt be dealt with in a more practical manner, and some recommendations submitted to the government regarding the future timber policy of the province. This policy must bear some relation to the quantity of timber owned by the Crown, with regard to which estimates greatly vary. With a view of ascertaining as nearly as possible the extent of the timber lands of Ontario, the Commission have visited various districts in the northern part of the province, and are understood to have found a greater quantity of both pine and spruce timber than was anticipated. It is much to be desired that the work which the Commission has commenced should be continued until we are placed in possession of reasonably accurate data regarding the supply and localization, not only of pine and spruce, but also of hardwood timber.

PERSONAL.

Mr. Thomas Cowan, of the firm of Cowan & Co., manufacturers of woodworking machinery, Galt, Ont., died last month.

Mr. R. B. Bryce, of Glasgow, Scotland, who is an extensive lumberman in the old country, has been travelling through Canada for some weeks.

We regret to learn of the serious illness of Mr. James L. Burton, the well-known lumberman of Barrie, Ont., and hope that he may soon be on the road to recovery.

Mr. W. R. Ledger, of the Ontario Crown Lands Department, is receiving the congratulations of his friends, on the occasion of his recent marriage. The bride was Miss Smith, of Little Britain.

After being confined to his home for several weeks by serious illness, necessitating a surgical operation, Mr. George A. Anderson, of the wholesale lumber firm of J. G. Cane & Co., Toronto, has recently resumed his business duties.

Messrs. Bertram & Son, of Dundas, Ont., are about to make extensive additions to their works, in order to meet the requirements of their growing trade. It is the intention to roof in the space between the several individual buildings, and in this way, and by removing entirely out of the way one of the old buildings, to gain some 12,000 square feet of floor area. The company are at present filling orders for lathes and other iron-working machinery for customers in Russia, France and Great Britain. They are also manufacturing a large shear weighing 50 tons to be used for cutting up into scrap iron the iron in the old Victoria bridge at Montreal. The machine is to be installed in the Hamilton Rolling Mills.

"GALL."

(Rough Draft of Explanatory Design to accompany Mr. Hardy's Memorandum in reply to Messrs. Dickenson and Lansing, of Michigan.) [From the Toronto Globe.]

CALCIUM CARBIDE FROM SAWDUST.

The experiments that are being made at the mills of W. C. Edwards & Company, New Edinburgh, Ont., to determine the value of sawdust for producing calcium carbide and other commercial products, continue to be of an encouraging nature. On October 18th a test of the machinery was made before a large number of Ottawa lumbermen and other interested persons, including the following: Prof. Ruttan, of McGill University, Montreal; Messrs. J. R. Booth, F. P. Bronson, G. B. Greene, David MacLaren, R. M. Cox, J. F. Booth, J. A. Cameron, Hon. David Mills, Sir Louis Davies, Sir Henri Joly, Lt.-Col. Anderson, Major Gordeau, John Gilmour, Allan Gilmour, W. J. Conroy, J. C. Edwards, A. H. Edwards, H. A. Bate, H. N. Bate, W. A. Cameron, Ward Hughson, D. Murphy, Capt. Murphy, C. E. Read, H. McPherson, and Mr. Burdette, of Burlington.

The test was most satisfactory, and gives the promoters every reason to expect the ultimate success of the scheme. The machine was shown producing oil, acid, gas and carbon, and samples of the pyroligneous acid were taken by Prof. Ruttan to test at McGill University.

The machine runs automatically; first the sawdust goes through a drying process by having all the excess of heat contained in the burned gases forced through the sawdust in a drying kiln. This dried dust is carried by an elevator to the top of the retort, and by means of an automatic feed is supplied to the machine as quickly as it is required. The retort is an upright iron cylinder, between 15 and 20 feet high, and about 3 feet in diameter, surrounded by brickwork. Within the retort are a series of hoods on a central hollow revolving axle, which has perforations under the hoods. The various gaseous products escape through the lower end of the retort, where the liquid products are condensed and separated, escaping through two outlets. At one passes off a mostly wood creosote, which can be utilized for a variety of purposes, and from the other crude pyroligneous acid, from which can be prepared wood alcohol, acetic acid, and various other products. The gases pass through a purifying process, and after being highly heated are forced through the sawdust as it passes down the retort. The excess of gases pass into the furnace, supplying heat, which is practically sufficient to carbonize the sawdust in the retort. The carbon prepared from the sawdust passes out through an opening for the purpose in the lower end of the retort. Carbon derived from this source, owing to its density and purity, is superior, and produces what is known as charcoal iron, which commands the highest price in the market. Calcium carbide, derived from this source of purified carbon, is worth from $60 to $70 per ton. As the mills in the neighborhood of Ottawa produce about 900 tons of sawdust per day, it is easily understood that, if the hopes of the experimenters are realized, Ottawa will reap enormous benefits.

"WANTED AND FOR SALE."

Persons having for sale or wishing to purchase a particular lot of lumber, a mill property, timber limits, second hand machinery, etc., in fact, anything pertaining to lumbering operations, will find a buyer or seller, as the case may be, by placing an advertisement in the "Wanted and For Sale Department" of the Canada Lumberman *Weekly Edition. Testimonials to the value of this department by those who have given it a trial state that the results of advertisements were frequently better than anticipated; the cost is comparatively small. Mill owners might, with profit to themselves, make use of this method of advertising their stock to a still greater extent.*

THE RETAILER AND Wood-Worker

UNIQUE SPECIMEN OF WOODWORK.

AFTER sixteen years of labor, off and on, Llewellyn Cunningham, of 184 Adams street, Dorchester, N.B., has recently completed a table which stands unique as a specimen of handiwork with carpenters' tools. When it is stated that in the construction of this piece of furniture the maker has utilized over 160,000 separate pieces of wood, the reader will have a slight idea of the magnitude of the task. It is not alone in this, however, that the interest in the table lies, for included in the immense number of pieces worked into its construction there are 270 different species of wood, from all parts of the world, as well as relics from railroad disasters, floods, big fires, battle-fields and old government ships, and others commemorative of important events.

Mr. Cunningham began work on the table in 1882, then having considerable leisure at his disposal, and from that time until the present he has worked a few hours each day upon the affair. During all these years he has kept strict account of the hours so spent, and he reckons them at 3,692. The result is that in its completed state the table is not only ornamental, but useful as well. By Mr. Cunningham's ingenuity, patience and perseverance, he has worked every piece together, however small, into odd and striking designs, which are inlaid on the top, bottom and legs. The central design in the top is a checker board, which contains the largest pieces to be found in the table. These are 1½ inches square. The finest work, into which are worked the smallest pieces, figures about 1,200 of them to the square inch. Of the various soft woods, a very small piece of each has been utilized. Of the hard and rare woods many pieces of the same kind were used. These woods were obtained at considerable expense and labor, and came from every state and territory in the United States, as well as from Nova Scotia, New Brunswick, Prince Edward Island, Cape Breton Island, British Columbia, Quebec, Manitoba, Mexico, Chile, Peru, the Andes Mountains, Bolivia, United States of Columbia, Honduras, Venezuela, the Guianas, Ecuador, Brazil, Argentina, Rio de Janeiro, Trinidad, Russia, China, Japan, Siberia, Asia Minor, Turkey in Asia, Constantinople, Austria, Hungary, Prussia, Poland, Sweden, Lapland, Italy, France, Spain, Portugal, England, Ireland, Scotland, Norway, Greece, Cyprus, Sicily, Sardinia, Borneo, Sumatra, Singapore, Arabia, Persia, Madagascar, Liberia, Australia, Zanzibar, Africa, Cairo, Tasmania, Sandwich Islands, Society Islands, Samoa, Cuba and Porto Rico.

Among the many important events from which relics are worked into its construction are the railroad disaster at Ashtabula, Aug. 29, 1876; Spuyten Duyvel, Jan. 13, 1882, and the Quincy wreck, Aug. 19, 1890; also the big fires of Portland, Me., in 1860; Chicago, in 1871; St. John, N.B., in 1877; Boston, in 1872, and Seattle, Wash., in 1889, and the floods of Mill River, 1874, and Johnstown, in 1889.

Other interesting souvenirs are from the old government ships Ohio and Merrimac; a piece of the Benedict Arnold house in New Haven, Ct.; a piece of the Judges' cave and the old Yale fence in the same city; a piece of shrub near Ledyard monument on the hill opposite New London; a piece of the old Liberty elm, Boston, and the old Washington elm, Cambridge; a piece of a wrecked car at the Pittsburg riot in 1877; a piece of the stock of a rifle shot off at Gettysburg, July 1, 1863, and a piece of the deck load of the barkentine Herbert Fuller, when she lay in Halifax harbor.

MAKING FIGURED VENEER.

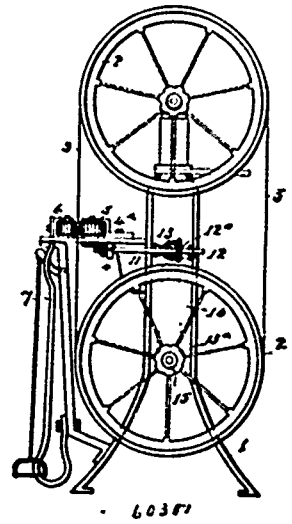
THE Timber Trades Journal, of London, England, gives out the formula by which a curious yet beautifully figured piece of veneer is now being made. It is difficult to secure figured wood which can be thoroughly relied upon, but by this method a figure is artificially produced with the certainty of securing a very effective result. The process has mainly been applied to Italian walnut. An ordinary log is first cut into veneers of perhaps thirty to the inch. These veneers are then glued together and pressed into a corrugated steel mould until a solid block several inches in thickness is secured, which is of a corrugated shape. From this block veneers are then cut, so that in each leaf of the new veneer the figures and marking of some eight others are intermingled, and a sort of fine tortoise-shell figure is produced. The effect is said to be strikingly beautiful, and there is little or no evidence in the veneers of how they were produced.

DEMAND FOR DOVE-TAILING MACHINES IN FRANCE.

THE United States Consul at Nantes, France, writes:—"One of the leading business men of Nantes informs me that certain American wood-working machines used in dove-tailing lumber for packing cases would find a market here. The gentleman was unable to give the name of the manufacturer, or the exact name of the machine, but said he saw them working in England, and that they did their work neatly and rapidly. An immense amount of lumber is constantly used here in making the cases in which small sardine boxes and packages of conserves are packed for shipment. Not only could the machine be used in Nantes in dove-tailing lumber for boxes, but also at Brest, Lorient and Concarneau, where other large sardine factories are located, and at Samur, where quantities of fine wines are packed for shipment. Thousands of cases are also used by the extensive biscuit factories of Nantes. Manufacturers wishing to place the machines on the market in this part of France will do well by corresponding with Mr. Edward Kerr, 3 rue Gresset, Nantes." Here is an opening for Canadian manufacturers of wood-working machines.

PATENTS FOR WOOD-WORKING MACHINERY.

PATENTS have recently been granted in Canada for the following wood-working devices:

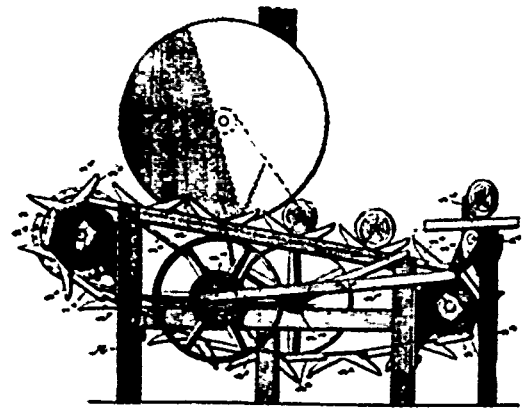


60351

MACHINE FOR SAWING BARREL HOOPS.

Patentee: T. C. Seckel, Bay City, Mich., granted June 13th, 1898; 6 years.

CLAIM.—In a machine for sawing barrel hoops from poles, having a band saw with a horizontal swing table and a yielding whip roller, flexibly mounted, combination feeding and guiding mechanism, consisting of a vertical guide roller at the side of the saw and substantially on the same transverse line with the saw teeth and the axis of whip roller, together with means of rotating said roller at a speed proportional to the speed of the saw, the roller being mounted on a line with the teeth of the saw, and forming a fulcrum about which to swerve the pole in feeding.



60313

WOOD SAWING MACHINE.

Patentee: Samuel W. Butterfield, Three Rivers, Que., granted 13th June, 1898; 6 years.

CLAIM.—In a log sawing machine, comprising a frame, drums mounted on each end of frame, a series of log carrying chains mounted on said drums, and having movement thereon, said chains being adapted to carry a log into and past the movement of a saw, and an automatic log releasing device adapted to place the logs on said chains singly. The log carrying chain comprises a series of log carrying links, and a series of connecting bars arranged alternately; a link having a V-shaped opening, and log engaging teeth extending inwardly from the sides of said opening, the chains being arranged in a manner to retain the portions of the log after being sawed.

Readers of THE LUMBERMAN who contemplate enlarging their mill, or purchasing new machinery of any kind, are asked to advise us of their requirements. Such information is greatly appreciated.

SEFUL INFORMATION

o boiler will give good results unless the circulation ee and rapid. To overcome the difficulty experienced h some kinds, where there is no circulation in some ts of them, ejectors have been used to take the water of the dead spaces and discharge it into other parts ere the water is always in motion so long as there is fire in the furnace.

oose crank pins, and how to make them tight, is an resting theme, and frequently comes up for discussion ong engineers. One of the best remedies that I have rd of is to bore holes partly in the pin and partly in boss of the crank, the holes being parallel to the axis the pin, then driving in iron bolts that are a perfect fit d riveting them solidly in place.

INSPECTING BELT LACING. A good practice is to draw extra pieces of lacing over the regular strips, and then re a board in close proximity to the belt as it runs. he result is that the outside pieces, which are not inded to hold any of the stress, catch all of the wear, and s soon as a piece is worn in two the centrifugal force due its motion causes it to strike the board and attract ttention. It is not at all necessary to shut down when is warning note is heard, for no one will know it to be t the outer part, but it should be attended to the next me that the engine is shut down. The adoption of this an will save delays in many places where they are now onsidered a necessary evil.

BOILER CLEANERS. A correspondent of the Scientific lachinist, on the advice of a brother engineer, took a ood sized stick of cordwood (oak), put it in the boiler nd screwed a jo the brace so that it could not get fast be ween the flue and the shell when the water was low. fter a week's run he found a great deal of scale had ome off the sides, and a lot more was loose that was asily knocked off. At the end of the third week the cale was loose on the flues and easily knocked off. By ontinuing to use oak wood and to clean out once a week, n a remarkably short time he had the boiler free from cale. The difference in firing alone was no small matter It is best, he says, to clean every week when using the ood, as it does not reduce the scale to a med. Blowing ff causes it to gather around the blow-off, which, if left o long, is apt to burn the shell, owing to its keeping the ater from the shell.

OLIVE OIL. There is no question but olive is the best il to be used for many purposes in both mill and shop; s advantages over other kinds are that it softens, and ven after a year or more does not become stiff and hard, nd the oil remains fresh and sweet in it. It is very diffiult to detect adulteration in oil, and as olive oil is mixed o a large extent with cotton seed oil, it behooves the urchaser to be very careful what he is doing, or some mart drummer will sell him a few barrels of cotton-eed oil with a little olive mixed in for the best pure ive oil. The following is a good test for oil: Take a ortion of the oil and stir it up with forty parts of a soluion of carbonate of soda of three degrees of Baume. If he oil forms a milky emulsion, without any oil drops on he surface, it is a guarantee for a good greasing of the ubject to which it is applied.

It would be a wise precaution for every mill owner to ssist to his foreman posting himself on the laws relating o accidents. There are some plain decisions that have been rendered by the courts which can readily be obtained. A little knowledge sometimes might save a man's life and a big expense bill. For instance, the supreme court of Louisiana recently held "that it is negligence for the foreman of a steam saw mill to call on one of the employees suddenly and on the spur of the moment to take a position in the mill that is dangerous without giving him any instructions or explanation whatever of the movements of the machinery or the risk and hazard of the employment, of which the employee had no previous knowledge." A careful foreman who knew this to be the law would see that the interests of his employer were cared for and the safety of the employee guarded by advice.

TO TELL WHEN TIMBER WAS CUT.—A current item says that timber cut in summer represents a lower value than that felled in winter, and it is of great importance to buyers to know when a trunk was hewed. Timber hewed during the resting period—i.e., between October and April—contains in its cells numerous starch particles which cannot be found in wood cut down in summer. This starch closes the pores, and the wood becomes coarse and impenetrable. This is the reason that winter-hewed timber is exclusively employed for staves. Made with staves from summer-hewed wood, the barrels leak and the contents may evaporate through the pores. A sure test is the use of iodine, which gives the starch in the winter wood a violet color. If the timber to be examined is coated with an iodine solution, and the surface of the felling side shows yellow, it may be taken as a certainty that the tree was cut down in summer. The light yellow lines are the moisture rays, while cells, tissue and wood fibres simply take on a yellow coloring. In winter-hewed timber the amylaceous rays form much darker, ink-colored, black stripes on the yellow ground.

POWER CONSUMED BY WOOD-WORKING MACHINERY. Prof. O. G. Dodge, U.S.N., who was chief electrical inspector at the World's Fair, recently made some careful tests to determine the power required to drive wood-working machinery at the navy yard in Washington. With a circular rip saw 28 inches in diameter and running at 1,200 revolutions per minute (or 8,800 lineal feet per minute), and ripping seasoned hard oak 7/8 inches thick, with a feed of 10 feet a minute, 18.8 mechanical horse power was used. The motor and saw running idle absorbed 2.1 horse power. In other tests with rip saws of 24, 14 and 12 inches diameter, and at varying speeds of from 1,500 to 2,000 revolutions per minute, the mechanical horse power output ranged from 2.6 to 8.9 horse power. A band saw running at 160 revolutions per minute (or 3,017 lineal feet per minute) required 10.4 mechanical horse power when the motor was running idle. When ripping seasoned ash 10¼ inches thick, with a feed of 6 feet per minute, but 14.8 horse power was consumed. In ripping yellow pine 12 inches thick and running 20 feet per minute, 17.6 horse power was consumed. The above figures are in contrast with the work done by a band saw having a pulley 28 inches in diameter and running at 480 revolutions a minute. With a belt pulley 12 inches in diameter and 3½ inches face, and with the motor belted to the saw shaft, the motor consumed nine-tenths horse power when running idle, and but 1.3 horse power when ripping seasoned oak 3 inches thick, and with a speed in one case of 2½ feet per minute, and in the other cases of 4 feet per minute, the difference in speed apparently making no difference in the consumption of power.

THE AMERICAN BOARD RULE. The American board rule is founded upon the principle that a foot of lumber is one inch thick and 12 inches square, and that this is composed of 12 pieces one inch wide and 12 inches long. In a 12 foot board it takes a strip one inch wide the whole length of the piece to make a foot of lumber; in a 14 foot board it takes a strip the whole length of the board only 12/14 of an inch wide, and if 16 feet long only 12/16 of an inch wide, and by the same theory an inch in width in a 12 foot board, as has been stated, makes one foot of lumber; a strip an inch wide in a 14 foot board makes 14/12 feet or one foot and 1/12, or 1/6 of a foot over. But as the figures on the board rule represent the number of feet in a board whose width corresponds with those figures, it must be seen that in a 12 inch board, as has already been stated, it takes an inch in width to make one foot, hence the figures in the 12 foot run are all exactly one inch apart on the length of the rule, but in a 14 foot board it requires only 12/14 or 6/7 of an inch in width to make a foot of lumber, hence in the 14 foot run the figures on the rule are placed 6/7 of an inch apart. In a 16 foot board it requires only 12/16 or ¾ of an inch in width to make a foot, hence in the 16 foot run the figures are only ¾ of an inch apart. The same rule holds good in all lengths over 12 feet, but in lengths under 12 feet the rule is reversed, the spaces being wider between the figures. For instance, if the board is only 10 feet long it will require 12/10 or 1⅕ inches in width to make one board foot, hence in the 10 foot run the figures are 1⅕ inches apart. In the 11 foot run they must be 1 1/11 inches apart. O. S. Whitmore, in Dixie.

No matter in what part of the Dominion you are situated, an expression of your views on any subject relative to the lumber trade is solicited by the publishers of this journal.

The lumber journal of Sweden is called the "Svensk Travarutidning." It contains a great deal of valuable timbereskme and statististical lumbertolsons. It wants to be read out loud to be appreciated, quotes a contemporary.

A TWISTED BAND SAW.

THE engraving herewith is from a kodak picture of a band resaw six inches wide by 32 feet long, 18-gauge thick. This saw was doing first-class work and had no cracks in it, writes A. J. Burton, in the Wood-Worker. The sawyer was called away one day very suddenly, and the manager was obliged to put on a man of less experience in his place.

Things went along nicely till they were obliged to change saws; then the trouble commenced. The first saw the new man put on was not placed on both wheels alike. It was about one inch off the top wheel and about two inches on the lower wheel, so that when he first started up, the saw oscillated so much that the teeth hit the husk or bed iron, and knocked all the points off the teeth half way round the saw, which had to be taken off and refitted.

The next saw he run about 20 minutes. Up he came to the filing room and asked me to come down and look at the saw, which was "notching" the boards, as he called it. And no doubt it was, for by the time I got to it the saw was nearly red hot and would hardly stay on the wheels, to say nothing of sawing lumber with it. I did not stay long, for I saw it was all day with that saw. I told him to take it off.

A TWISTED BAND SAW.

As soon as released from the wheels, it twisted and coiled up as shown in the engraving, but not before it presented the men handling it with several cuts and wounds, so much so that one of the men was obliged to go to the doctor to get his wounds dressed.

The whole trouble was that a sliver got in between the guide and the saw and caused it to heat, and the sawyer, not knowing what was the trouble, kept on sawing. Soon as the saw got so hot that it could no longer stand up and cut, it dished or turned over and run clear out of a three-inch plank, and this caused the saw to twist as you see.

One trouble after another continued for a week, till the regular sawyer returned. By this time the new man had moved nearly every part of the machine, so the whole thing had to be re-adjusted. After the regular sawyer got the mill properly adjusted, everything run perfectly and the saws did not "notch" the boards, as the new man termed it. My advice to mill men is to always try to secure a good, experienced man to operate these machines, for "the best are the cheapest."

Messrs. Herman, Voss & Sons, York, Pa., in remitting their subscription to THE LUMBERMAN, write "We look for THE LUMBERMAN weekly and profit thereby. Wishing you success."

THE NEWS.

—Mr. Contine has purchased a saw mill at Bayfield, Ont.

—J. Smith, of Hall Landing, Ont., purposes rebuilding his saw mill.

—J. W. Templeman is enlarging his broom handle factory at Burk's Falls, Ont.

—An agent of one of the steamship companies at Montreal has received enquiries for prices on barrel heads and casks for export to Spain.

—Tenders are called for the purchase of the plant and premises of the W. R. Gardner Tool Co., Limited, Sherbrooke, Que., in liquidation.

—W. Craddocks, of Huntsville, Ont., has increased his plant for turning out saw handles, baseball bats and other woodworking specialties.

—The town of Peterboro', Ont., has granted a bonus of $30,000 to the Wm. Hamilton Manufacturing Company, to assist them in extending their works.

—Elrick Sedvall has given particulars to the city council of Winnipeg, Man., of a match factory to be erected in that city by a Swedish syndicate. It will employ fifty hands.

—James Gillies, of Carleton place, John Gillies, of Braeside, and other lumbermen, have been incorporated as the Lake Temiscamingue Navigation Company, with a capital of $25,000.

—Long & Thompson, of Orillia, Ont., are filling a large order for the English syndicate which has undertaken the work of carrying to completion the big pulp and paper enterprise at Sturgeon Falls.

—Mr. Allcroft, of the firm of Dent, Allcroft & Co., glove manufacturers, London, Eng., and Mr. Davey, have been in New Brunswick recently relative to securing a supply of lumber for boxes and cases for their extensive glove shipments.

—Geo. F. Roy & Sons, of Sprucedale, Ont., have bought from the John Abell Co., Toronto, their saw and shingle mill at Starrat. They have now one thousand acres of timber land, and will commence cutting on a contract of 300,000 feet of hardwood.

—J. A. Craig, of Shanghai, China, a former Canadian boy, is at present in this country, for the purpose of working up a trade between Canada and China. He states that there is a good market in the latter country for lumber, and while here he will arrange for some trial shipments.

—Minneapolis sash and door manufacturers who are seeking trade in Manitoba find that the new sash and door factory of the Rat Portage Lumber Company, at Rat Portage, Ont., is a strong competitor. This plant is just completed and is more nearly modern than any such plant in northwestern Canada.

—Price Brothers, of Quebec, have purchased ground at Batiscan, Que., for the erection of a saw mill, to which will be transferred their present plant at St. Stanislas. The mill will be equipped with the latest modern improvements, lighted by electricity, and with a capacity for sawing 200,000 logs per season.

—A delegation of Ottawa lumbermen waited on Sir Wilfred Laurier, Sir Richard Cartwright and Sir Louis Davies recently. It comprised Messrs. J. R. Booth, W. C. Edwards, M.P., A. Lumsden, M.P.P., and Levi Crannell. The position of the lumbermen of Ontario was discussed, during which some doubt was expressed as to the wisdom of the manufacturing clause.

—The saw mill on the C. P. R. at Biscotasing, Ont., formerly owned by Simpson & O'Neil, of Lindsay, but operated for the past couple of years by Thos. Sadler & Company, was closed down last month, the limit having become completely exhausted. A large stock of old lumber on hand has been disposed of to the C.P.R., and shipping has been going on steadily all summer. This year's cut of lumber about 4,000,000 feet is still in the yard, but a very large quantity of bridge timber was cut and sold to the C.P.R. and the Copper Cliff Mining Co. at Sudbury. At present there is a prospect of disposing of the mill at Biscotasing to an American firm, who, if they purchase, will remove it to a limit near Sudbury. Several offers have been made for the lumber on hand, but Messrs. Sadler & Co. have decided to hold till next season, believing that prices will advance.

—A case known as Creighton vs. Pacific Coast Lumber Company was heard in Winnipeg last month. The plaintiff is a lumber merchant in Winnipeg and defendants carried on business in New Westminster. In March last defendants agreed to sell to plaintiff a carload of clean cedar strips of second grade or better; a carload was shipped and defendants drew on plaintiff for the amount due, plaintiff paid the draft and also paid the C.P.R. $120 for freight. When the lumber was unloaded plaintiff claimed that none of it was of the grade agreed to be sold to him by defendants, and he refused to accept same, and notified the defendant company that it was held subject to their order. Plaintiff claimed that because the lumber delivered was not of the character ordered he was entitled to refuse acceptance thereof and to be repaid the sums paid by him. Defendants alleged that the plaintiff examined and inspected the lumber before completing the purchase and satisfied himself as to the quality thereof. They denied that there was any express or implied warranty on their part and that the plaintiff had any claim against them. Judgment was reserved.

CASUALTIES.

—Joseph Sawyer, of Hintonburg, Ont., was drowned while booming logs on the Madawaska river for McLachlin Bros.

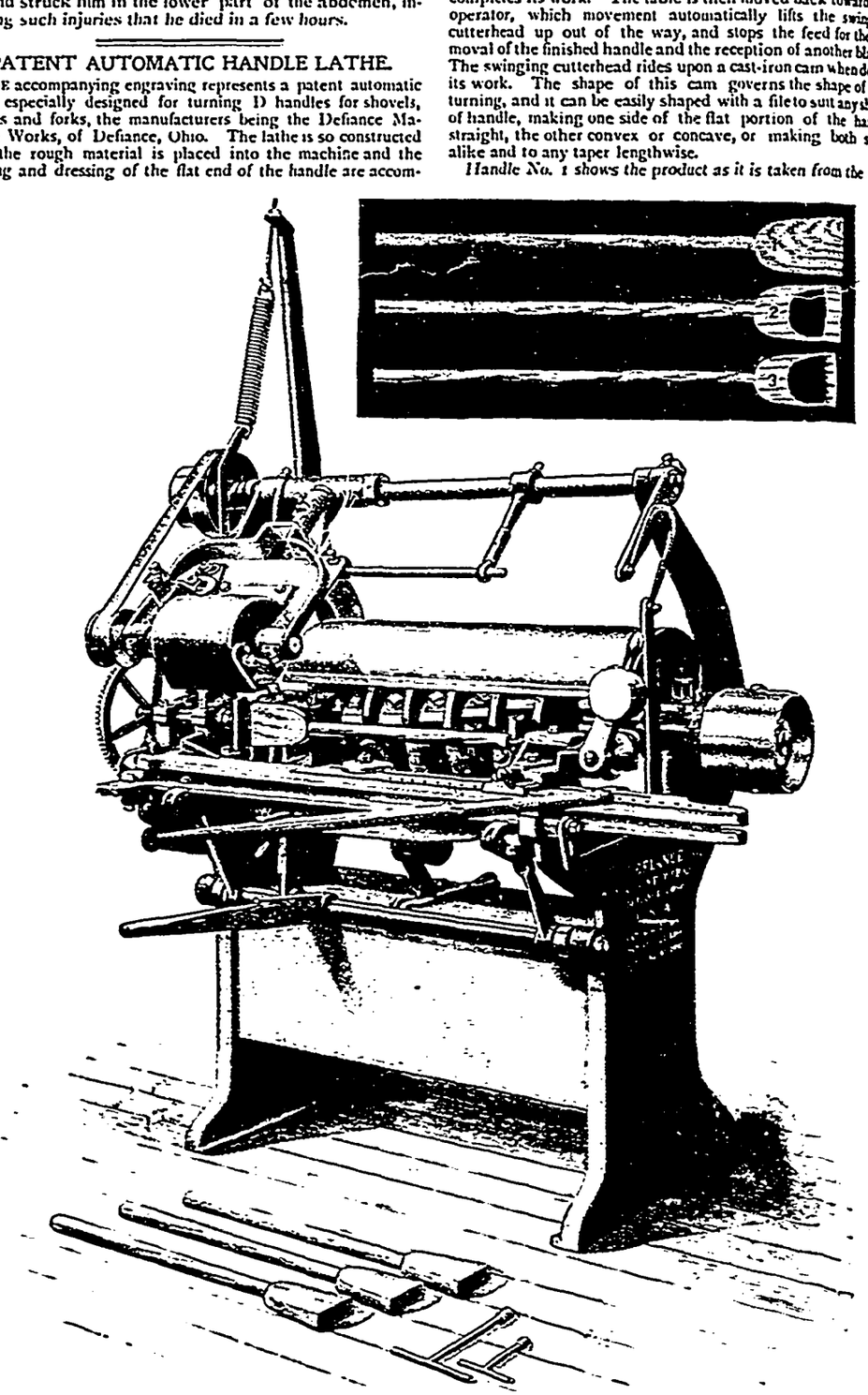
—Paul C. Kaiser was killed in Tait's logging camp opposite Borven Island, B.C., by being struck by a log passing down a chute.

—Charles Brown, a son of the night watchman at J. A. Morrison's shingle mill at Fredericton, N.B., was seriously injured by falling under a moving loaded car.

—A sad accident occurred at Conroy's Mills, at Deschenes, Que., whereby Richard Baulke, an employee, met a sudden death. Baulke was employed at a saw used in cutting slabs, and was in the act of pushing a board up to the revolving saw when a large splinter flew off and struck him in the lower part of the abdomen, inflicting such injuries that he died in a few hours.

PATENT AUTOMATIC HANDLE LATHE.

THE accompanying engraving represents a patent automatic lathe especially designed for turning D handles for shovels, spades and forks, the manufacturers being the Defiance Machine Works, of Defiance, Ohio. The lathe is so constructed that the rough material is placed into the machine and the turning and dressing of the flat end of the handle are accomplished at one and the same time. The work is accomplished at the rate of 2,000 handles per day.



No. 1 PATENT AUTOMATIC D HANDLE.

In a circular descriptive of the machine the manufacturers say:

Its advantages are very great over other machines intended for the same purpose. Turning and dressing the handle at the same operation effects a saving of several machines and operators, and the work is performed more accurately, as the handle end is always true with the stem or round portion of the handle. A uniform tree and smooth product is guaranteed. The frame is heavy and substantial, overcoming all tendency to twist or spring, securing an easy uncramped movement to the working parts. The cutterheads are of large diameter and fitted to a 2¼" steel spindle. They are locked to it by a friction grip, no set-screws touching the shaft to mar it. Each head is fitted with three shear-cutting knives, and a sufficient number of heads are used to cover the longest handle to be turned, forming a continuous cut over the full length of handle. Different lengths of handles can be made by simply adjusting the tail stock horizontally on the table. It is also provided with a right-angular adjustment to turn the handle parallel or to any taper. The table carrying the centres which support the material to be turned slides to and from the cutters by a convenient hand-lever, and when moved up to the cutters to a point where the turning shall begin, the handle blank is slowly rotated and finished. At the same time, the swinging cutterhead for dressing the flat sides of the handle automatically comes down and completes its work. The table is then moved back toward the operator, which movement automatically lifts the swinging cutterhead up out of the way, and stops the feed for the removal of the finished handle and the reception of another blank. The swinging cutterhead rides upon a cast-iron cam which does its work. The shape of this cam governs the shape of the turning, and it can be easily shaped with a file to suit any shape of handle, making one side of the flat portion of the handle straight, the other convex or concave, or making both sides alike and to any taper lengthwise.

Handle No. 1 shows the product as it is taken from the machine; No. 2, after having been punched by a special machine for that purpose; No. 3, a finished handle after being dressed and the hand-hold rounded, which is also accomplished by special machines which we build for that purpose. The several operations necessary in D handle making are done by our machines, and do not require expensive skilled labor.

The counter for this machine is furnished as follows: Shaft 2⅞" x 6' long; two No. 2 ball-and-socket adjustable hangers; driving pulley, 30" x 6", for main cylinder; driving pulley, 18" x 2½", for swinging cutterhead; tight and loose pulleys, 14" x 6", speed 600 rotations per minute.

WOOD PULP DEPARTMENT

SCANDINAVIA VS. CANADA.

From the report of the annual meeting of the Scandinavian Chemical Pulp Union, it will be seen that the sulphite pulp manufacturers are becoming alive to the fact that they have a very powerful rival to meet in Canada, and have decided to send a representative to the United States and Canada, to find out what they will have to fear from the new sulphite mills now building or projected in those countries. There is no doubt they will find Canada a very hard nut to crack, for the maritime provinces have already proved that they can compete profitably in this market, while many of the new mills are backed by British paper-makers' capital, and can count on being supported by the paper-makers represented. Among these latter we may mention the St. John Sulphite Co., the capital of which has been furnished almost exclusively by Scotch paper-makers; the Dominion Pulp Co., an English company, with one of the largest English paper-makers at its head; the Cushing Sulphite Co., two-thirds of the capital of which has been guaranteed by another well-known English paper-maker. English capital has also been invested in other well-known concerns. It was at one time thought that the competition in sulphite pulp this year would be very severe, owing to the large number of new mills projected in Scandinavia, but as ready pointed out in our market reports, several of these have been built with a smaller capacity than originally intended, while other schemes have been held in abeyance in the meantime, so that the prospects for the new Canadian mills are not so dark as they might have been. The great drawback to the Canadian makers at present is the heavy freight on pulp, and when this is remedied, as it is sure to be by-and-by, as the industry develops, they will compete on pretty equal terms with Scandinavia. For, although in the latter country labor is cheaper and the market nearer at hand, Canada has the advantage of cheap wood of excellent quality, and in practically unlimited quantities. There have been many rumors lately that Scandinavian pulp-makers will put in paper machines if the Canadian competition in pulp becomes severe, but we think this would be a mistake, as they cannot afford to adopt the same tactics as United States paper-makers, who find it profitable to dump their surplus here at a loss rather than spoil their own market, for the Scandinavians have practically no market of their own to speak of. Victory is generally on the side of the biggest battalions, and the result of the struggle for the wood-pulp trade will doubtless be in favor of the country which has the most natural advantages for its production.—Paper and Pulp, London, Eng.

At the new pulp mill at Mispec, near St. John, N. B., 80 men are still employed in building operations. It is expected that it will be ready to open about the middle of January or the first of February. Mr. B. Mooney is local manager.

NEW USE FOR WOOD PULP.

A CONTEMPORARY, Invention, states that a composition is made by Brandon & Sons which is intended to take the place of both leather and India rubber. This is as it may be, but the process may be described in the meantime. While one set of workmen is mixing ordinary "India rubber solution," preferably containing a little sulphur, with dry powdered chalk, another set is drying and breaking up ordinary sulphate pulp. The pulp is then mixed with the India rubber mixture. The whole mass is then made into a sheet and exposed to a temperature of from ninety-three to 107 deg. C. The object of the chalk is to enable this heating to be made moderate. If chalk is not used a higher temperature must be employed to make the India rubber combine firmly with the pulp, and this higher temperature much diminishes the durability of the India rubber, and causes the resulting composition, although answering as well at first as that made with chalk, to rapidly disintegrate when exposed to the weather, and especially to the sun.

The volatile matters present having been evaporated, the leaf is passed between rollers to compact it, as it is left in a somewhat porous and spongy state. A little soot or lampblack should be added to the chalk before incorporating that with the other ingredients.

The following are the recipes used:

	Lbs.
A. For India rubber:	
Dry sulphate pulp	100
India rubber solution	50
Chalk	50
Lampblack	5
Sulphur	5
B. For leather:	
Dry sulphate pulp	120
India rubber solution	40
Chalk	30
Lampblack	5
Sulphur	5

EXTENSIVE PULP AND PAPER MILLS.

A few years ago there was erected at Sturgeon Falls, Ont., a comparatively small pulp mill, but owing to limited capital, the venture was not a success. Recently a British syndicate, known as the Occidental, and represented by Mr. Ernest A. Bremner, of London, Eng., secured control of the property, and cast about to see how the business could be enlarged. After negotiating for several months, an agreement was reached with the Ontario government for the acquisition by the syndicate of seventy-five square miles of spruce limits along the Sturgeon river, and as a result extensive pulp and paper mills are to be established. The company agrees (1) to take up the property of the Sturgeon Falls Pulp Company and carry out and extend the objects of the original company, (2) to expend one million dollars in erecting paper mills, pulp mills, machinery, plant, etc., and utilizing the water power at Sturgeon Falls; (3) at least 240 hands will be employed, and at least 30,000 tons of paper turned out every year; $250,000 of the one million dollars must be expended in the first eighteen months, $500,000 within two years, and the whole sum within three years.

By way of encouraging the establishment of the enterprise, the government set apart for the use of the company the spruce and jack pine on 75 miles of limits on the Sturgeon river and its tributaries. For all pulp timber taken from these limits the company is bound to pay the government the usual dues, which are at present twenty cents a cord, but this rate may be increased from time to time at the discretion of the Lieutenant-Governor-in-council during the period of 21 years covered by the agreement. The company acquires no title to the land or pine timber thereon covered by the concession, nor is the land withdrawn from settlement.

Complaint has been made that the concessions given to the Sturgeon Falls syndicate by the government are too liberal, and that the result will be to give the concern a great advantage over enterprises less favorably treated. In reply to this, it has been pointed out that the agreement with the Sault Ste. Marie Company served as a model for this one, although in one or two respects the former is more rigorous. For example, the dues of twenty cents a cord, which are also imposed on the Sault Ste. Marie Company, are in its case unalterable for twenty-one years. In the case of the Sturgeon Falls Company they may be increased whenever it is thought fair to do so, the general prevailing rates for such a privilege being the guide. Concerning the matter the *Toronto Globe* says: It should be observed that before making the concessions in question the government insisted that the company should undertake not merely the manufacture of pulp, but the more finished product, the manufacture of paper. The company is under obligation to employ at least 240 men about the mills, but the employment of this number at the mills necessitates a considerable volume of work in the woods and on the rivers. This will afford employment for settlers in the winter, a great desideratum in new districts where the poorer settlers must find cash jobs to carry them over the lean years that every settler experiences while he is making his clearing. The agreement carefully provides that the logs taken shall be made into pulp and paper, and not exported as logs. It is, indeed, a beginning in Ontario of an industry that may become one of its greatest sources of wealth and employment.

The Occidental syndicate includes such men as Harold Gilmour Campion, son of Admiral Campion; H. G. Sinclair, of Tilley & Henderson, London, Glasgow and Belfast; H. Graham Lloyd, of B. S. Lloyd & Co., Maures Horner, director of the State Insurance Co., and of Richardson & Co., the big New Zealand wool house. Mr. Wm. J. Findlay, of Lawrence, Mass., has been appointed manager.

PULP NOTES.

The town of Woodstock, N.B., has decided to engage an expert to report on the outlook for establishing a pulp mill in the vicinity.

Mr. W. C. Edwards, M.P., of New Edinburgh, Ont., is reported to be investigating the outlook for a pulp mill in the vicinity of Ottawa.

An exchange states that some Ontario and English capitalists have an option on a site across the river from Campbellton, on the Quebec side, where it is said they contemplate erecting large pulp mills.

Mr. A. E. French, of Sundridge, Ont., has shipped the second consignment of balsam to be used for pulp. It will be a great boon to the farmers in Ontario if the balsam wood which is now being tried as an experiment will work satisfactorily in the manufacture of pulp.

The Scandinavian Chemical Pulp Association, at a recent meeting, decided to send Engineer Karl Everitt, of the Aras Sulphite Mill, to Canada and the United States to find out what competition the Scandinavian makers were likely to have to meet in the near future, and the probable effect on the market of the newly erected sulphite mills in those countries.

Mr. George Lake, of Glossop, England, who was commissioned by Captain Partington, of Liverpool, Eng., to report on the prospects for the proposed Cushing pulp mill at St. John, N.B., has been in Canada for the past month. He expresses himself as favorably impressed with the facilities at St. John for the manufacture of pulp, and it is believed that he will advise Captain Partington to invest in the undertaking.

The Parrsboro, N.S., Leader, says: The report of Mr. T. R. Allison on the adaptability of Parrsboro as a pulp centre, came to hand last Monday evening. The report, though not lengthy, is an endorsation of all the facts stated in the prospectus. Parrsboro, it states, is in a position to compete with the world in the manufacture of pulp, having cheap coal, good shipping facilities, plenty of raw material and lots of water. These and other points are touched on, and coming from a man who has had much practical experience in the pulp business, should have weight sufficient to interest capitalists.

Mr. F. X. Gosselin, of Quebec, has been appointed crown timber agent in the Yukon district, at a salary of $1,800 per year.

Mr. Emile Stehelin, of New France, N.S., has ordered another locomotive for his pole railway. It was purchased from the Robb Engineering Company, of Amherst, N.S.

The new pork-packing establishment of the Parkdale Blackwell Co., Limited, Toronto, is nearing completion. The building is a commodious structure of four stories, and is being equipped with latest up-to-date machinery and appliances, and is situated conveniently to the hog and cattle markets. The company anticipate requiring about three thousand hogs and one hundred head of cattle weekly. This enterprising company contemplate entering the export trade, in addition to giving attention to their large and growing home trade. We draw attention to their advertisement which appears in this month's issue of the CANADA LUMBERMAN.

THE ST. MAURICE LUMBER COMPANY.

SINCE the publication of our October issue, in which there appeared illustrations of the St. Maurice Lumber Company's mill at Three Rivers, Que., the following particulars have been received: The mill is 150 x 54 feet, and has two floors. The first, or lower floor, contains all the shafting and pulleys to drive the machinery, which is placed on the second floor. This floor is extended after the edgers to receive the transfer chain for the slash table and trimmer table. It is a double mill, having two No. 3 Allis band mills, with the necessary log carriages, steam feeds, live rolls and edgers. The logs enter the mill in the centre, where an endless heavy log haul-up is placed, and are delivered on to log rolls and placed on to the log skids by a double deck kicker, each provided with two arms and heavy steam cylinders. The logs are delivered from the skidway on to the carriage by steam log loaders and turned into position by steam niggers. The carriages open 40", and consist of heavy cast iron log seats, provided with Allis set works and automatic receding rig and offset. They are actuated by powerful 10" gunshot steam feed. The boards drop on to live rolls and are transferred by a transfer chain to the edger table. After passing the edger, the boards are sent to the end of the mill, where they are dropped on to a transfer running across the mill, bringing the boards to the trimmer. The edgings are dropped by the man behind the edger on to the slash table transfer. This transfer is built into the floor, and delivers edgings and small slabs on the slash table, carrying them under a mandrel with five cross-cut saws of 36" diameter. To resaw the heavier slabs, each side of the mill is provided with a circular re-saw. The slabs drop on to the live rolls, and are handled by a steam flipper on to the rolls feeding the re-saw, from whence the boards are transferred to the edger, and the remaining slabs on to the transfer to slab slasher.

The engines and boilers are situated on the south side of the mill. The saw-dust from each machine is collected and carried over the boilers into the furnace, which burns all the sawdust, making ample steam for the mill. Each of the boilers is provided with a Dutch oven. All refuse stuff, too small to work up, is carried by the refuse conveyor to the burner, which is situated south of the boiler room. All slabs passing over the slash table are cut into four foot lengths, dropping into a conveyor. As they pass along in this conveyor, the best pieces are taken out and prepared for pulp by being barked on Waterous barkers, of which there are four in an adjoining building next to the slash table. This is a new departure in preparing pulp-wood, as formerly no slabs were used for this purpose, all going to the burner. All the refuse slabs in this mill are barked and converted afterwards into pulp in their pulp mills. The roof above the band mill is raised, making a large and convenient room for preparing band saws. It is fitted up with a full line of Waterous band saw tools. The machinery and equipment of this mill was supplied by the Waterous Engine Works Co., Limited, of Brantford, and erected according to their plans under the supervision of their millwright.

ERRATUM.

By a peculiar circumstance the name of Mr. Alex Dickie, of Colchester, N.S., was confused, in our October issue, with that of Hon. A. R. Dickey, the member for Cumberland in the Dominion Parliament. This accounts for the word "Honorable" which appeared below the portrait of the former gentleman. However, both are prominent lumbermen and most enterprising businessmen.

ONE DOLLAR.

THE above sum represents the yearly subscription price of the CANADA LUMBERMAN, including both weekly and monthly editions, mailed to any address in Canada or the United States. Owing to postal charges, the subscription price to foreign subscribers is two dollars per year. Persons in foreign countries interested in Canadian timber products can invest that sum to no better advantage than by becoming a subscriber. Likewise every mill owner in Canada should read the columns of the CANADA LUMBERMAN. A sample copy will be gladly furnished upon request.

BUSINESS IS BUSINESS.

"The man who whispers down a well
About the goods he has to sell,
Won't reap the gleaming golden dollars
Like one who climbs a tree and hollers."

CANADA'S COMMERCIAL AGENTS.

FOLLOWING is the correct official list of Canada's Commercial Agents in Great Britain, British possessions and foreign countries:

J. S. Larke, Sydney, N.S.W., agent for Australasia.

G. Eustace Burke, Kingston, Jamaica, agent for Jamaica.

Robert Bryson, St. John, Antigua, agent for Antigua, Montserrat and Dominica.

S. L. Horsford, St. Kitts, agent for St. Kitts, Nevis and Virgin Islands.

Edgar Tripp, Port of Spain, Trinidad, agent for Trinidad and Tobago.

C. E. Sontum, Christania, Norway, agent for Sweden and Denmark.

D. M. Rennie, Buenos Ayres, Argentine Republic, agent for Argentine Republic and Uruguay.

In addition to their other duties, the undermentioned will answer inquiries relative to trade matters, and their services are available in furthering the interests of Canadian traders:

J. G. Colmer, 17 Victoria street, London, S.W., England.

Thomas Moffat, 16 Church street, Cape Town, South Africa.

G. H. Mitchell, 15 Water street, Liverpool, England.

H. M. Murray, 40 St. Enoch Square, Glasgow, Scotland.

Harrison Watson, Curator, Imperial Institute, London, England.

R. H. SMITH CO., LIMITED

St. Catharines, Ont.

We are the Sole Manufacturers of Saws under the

Simonds' Process

in the Dominion of Canada.

There is no process its equal for tempering circular saws. Other makers recognize this fact, as some of them, in order to sell their goods, claim to have the same process. All such Claims are FALSE, as the patentee in the U. S. and ourselves are the only firms in the world who use it.

MILL STREAM, QUE., on I. C. R'y, December 17th, 1894.

R. H. SMITH CO., LTD., St. Catharines, Ont.

DEAR SIRS,—Driving a 20 in. 13 gauge saw into frozen hardwood, using a 9 in. 4-ply belt, if it can be done satisfactorily, is a very severe test. Your saws have stood that test better than any I have tried. I have been experimenting with different makes—both home and imported—during the last five years, and give yours the preference. Last order is just to hand and will report on them by and bye.

Yours very truly, JAMES McKINLAY.

CAMPBELLTON, N.B., Nov. 17th, 1894.

R. H. SMITH CO., LTD., St. Catharines, Ont.

DEAR SIRS, In regard to your Shingle Saws, you can say that I have been using Shingle Saws of your make (Simonds) for the past four years, and they have given good satisfaction. I am running nine machines and use a good many saws, but have never had a saw yet that did not work satisfactorily. Before using your saws I used saws of American make, which worked well, but after giving your saw a trial have continued to use yours, as they are cheaper, and in regard to working qualities are all that is needed.

Yours truly, KILGOUR SHIVES.

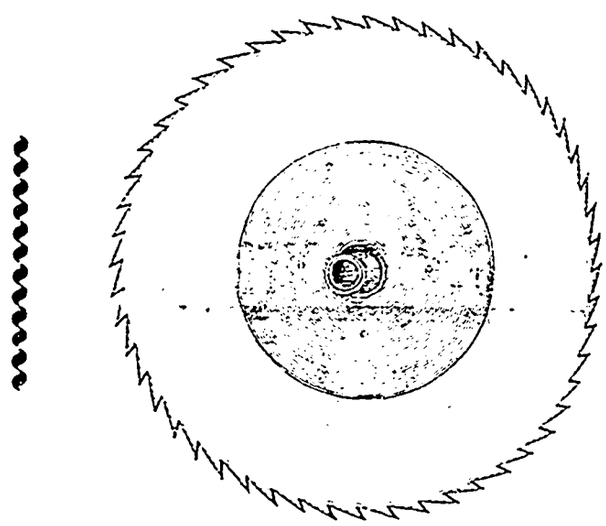
CLAVERING, ONT., May 3rd, 1897.

R. H. SMITH CO., LTD., St. Catharines, Ont.

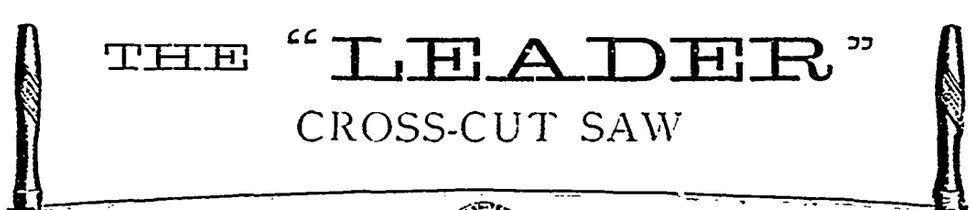
GENTS, In reply to your letter asking me how I liked the 62" SIMONDS Saw, I must say in all my experience I never had a saw stand up to its work like the one purchased from you last month. Having used saws for the last 22 years, and tried different makes, I can fully say it is the best saw I have ever had in my mill, and would recommend the SIMONDS' Process Saws to all mill men in need of circular saws.

Yours truly, W. G. SIMMIE.

P.S. *I am sending you my old saw to be repaired; please hammer to same speed as new one.* W.G.S.



THE "LEADER" CROSS-CUT SAW

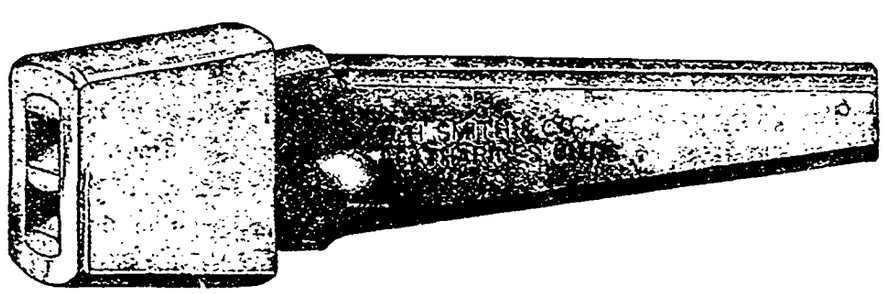


These Saws are made from the best DOUBLE REFINED SILVER STEEL, warranted four gauges thinner on back than front, and the only Saws on the market that are a perfect taper from the points of the teeth to the back, and require less Set than any other Cross-Cut Saw.

They are tempered by the Simonds' Patent Process, insuring a perfectly uniform temper throughout the plate, and stand without a rival as the BEST, FASTEST, AND EASIEST-CUTTING SAW KNOWN. A gauge to regulate the clearing teeth is furnished with each saw.

Directions for Setting and Filing are plainly Etched on every Saw. None genuine without our Registered Trade Mark as shown in cut.

THE "LEADER" SAW SWAGE



Made in 3 Sizes—$2.00, $2.50, $3.00 Net.

OUR PRICES ARE RIGHT. KINDLY ALLOW US TO QUOTE YOU BEFORE PURCHASING.

R. H. SMITH CO., Limited, St. Catharines, Ont.