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THE CANADA LUMBERMAN

Wood-Workers', Manufacturers' and Millers' Gazette

VOLUME XXIII.
NUMBER 7.

TORONTO, CANADA, JULY, 1903

TERMS, \$1.00 PER YEAR
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BALATA
AND
"CAMEL BRAND"
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NOT AFFECTED BY DAMPNES
THE BEST FOR MAIN DRIVES.
MOST DURABLE.

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A Good Thing

A good thing is always worth the money. This is true of our belting.

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Lumbermen's Tents, Waterproof Horse and Wagon Covers, Feed Bags, Coal Bags and Waterproof Clothing

OF EVERY DESCRIPTION.

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Tents and Tarpaulins made of our special non-absorbent duck. Overalls, Top Shirts, Driving Pants, Shoes and Hats, Underwear, Blankets, Axes, Moccasins, etc.

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16 CENTS PER POUND.



For High Duty Bearings.
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Never is affected by wetness, and does not stretch.

Excels in Transmission Power

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IN STOCK IN OUR MONTREAL WAREHOUSE

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MANUFACTURERS OF

HIGH GRADE CIRCULAR AND LONG SAWS UNEXCELLED SHINGLE SAWS

THE
WM. HAMILTON MFG. CO., LIMITED,
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**Designers and
Builders . .**

of

**New and Modern Saw Mills and
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WE ALSO BUILD

Pulp Mill Machinery,
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Tools for the Care of Saws,
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The Wm. Hamilton Mfg. Co., Limited

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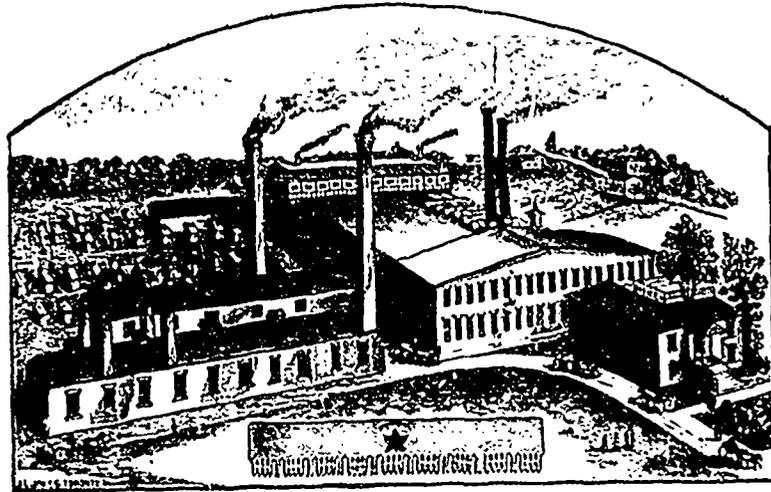
MAPLE LEAF SAW WORKS



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Manufacturers of

**CIRCULAR SAWS
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GROUND THIN ON BACK

Save Labor Save Gumming
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This Saw Stands Without a Rival

AND IS THE

FASTEST CUTTING SAW IN THE WORLD!

Its Superiority consists in its Excellent Temper. It is made of "Razor Steel," which is the finest ever used in the manufacture of Saws. We have the sole control of this steel. It is tempered by our secret process, which process gives a keener cutting edge and a toughness to the steel which no other process can approach.

Maple Leaf Saw Set

MANUFACTURED BY

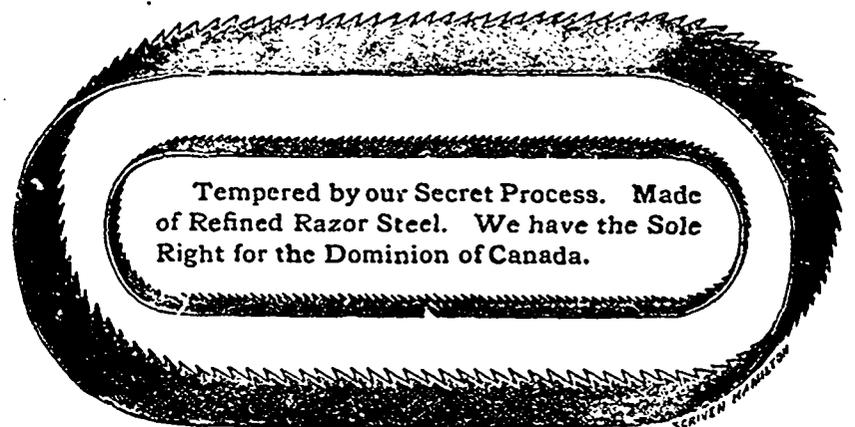
SHURLY & DIETRICH, Galt, Ont.

Directions.—Place the set on the point of tooth, as shown in the accompanying cut, and strike a very light blow with a tack hammer. If you require more set, file the tooth with more level.

If you follow directions you cannot make a mistake. Be sure and not strike too hard a blow, and it will set the hardest saw. On receipt of 40 cents we will send one by mail.



We are the only manufacturers in the world who export Saws in large quantities to the United States.



Tempered by our Secret Process. Made of Refined Razor Steel. We have the Sole Right for the Dominion of Canada.

We Manufacture

HIGH GRADE BAND SAWS

of All Widths and Lengths.

These Saws are made of Refined Swedish Steel imported direct, and tempered by our Secret Process; for Fine Finish and Temper are not excelled.

Petrie's Machinery Bargains

(List corrected every issue.)

WOODWORKING MACHINERY

- Defiance Self Feed Rip Saw Table.
- No. 1 Variety Saw Table, Clement, new
- No. 1, 2 and 3 Wood Top Rip Saw Tables, new
- 40 inch Band Re-Saw, new.
- 36 inch Pedestal Band Saws, new
- 32 inch " " "
- 26 inch " " "
- No. 1 Single Drum Sander, New.
- 20 inch Combined Disk and Drum Sander
- 18 inch Wood Turning Lathe.
- 28 inch Merritt Veneer Cutting Machine, new
- 28 inch Tompkins Plane, Met her M-lder and leader.
- 13 inch Nicholls Planer, Matcher and Moulder
- 24 inch No. 6 Goldie & McCulloch Single Surfacers
- 24 inch L. Mitchell & Co. Surfacers
- 24 inch No. 14 McGregor, Gourlay Double Surfacers.
- 24 inch Jackson, Cochrane Heavy Planer and Smoother, new
- 24 inch Jackson, Cochrane Revolving Belt Surfacers, new
- 24 inch Major Harper Planer and Matcher
- 20 inch Jackson, Cochrane Pony Planer
- 12 inch A. Dolg Pony Planer.
- Double Spindle Wood Top Wood Shaper.
- Double Spindle Iron Top Wood Shaper, Galt make, new.
- Railway Swing Cut-Off Saw Table.
- All Iron Swing Cut-off Saw Frames.
- 36 in. Circular Re-Saw, Galt Make.
- Left Hand Circular Mill, No. 1 Lane.

WATER WHEELS

- No. 12 Tuerk's Water Motor, 4 to 6 H. P.
- 48 in. Right-Hand Vulcan.
- 36 in. " " Perfection.
- 30 in. Left-Hand
- 25 in. Right-Hand, new.
- 23 in. " " Lefsel.
- 21 in. Little Giant.
- 12 in. Archimedian Brass, Waterous.

STONE CRUSHERS.

- No. 2 Dodge Stone Crusher.

HOISTING ENGINES AND BOILERS

- 6 x 8 Double Drum, Double Cylinder, new.
- 6 1/2 x 8 Double Cylinder, Single Drum, new.

BOILERS

- 60"x134"-21-4" Tubes, Submerged, new.
- 30"x60"-54-2" " " " "
- 30"x84"-54-2" " " " "
- 30"x72"-54-2" " " " "
- 24"x60"-31-2" " " " "
- 30"x72"-43-2" Tubes, Vertical, new.
- 30"x60"-43-2" " " " "
- 24"x50"-31-2" " " " "
- 20"x49"-19-2" " " " "
- 37"x66"-70-2" " " " "
- 28"x44"-37-2" " " " "
- 19"x44"-13-2" " " " "
- 45 h. p. Portable Fire Box Boiler, new.
- 35 h. p. " " " "
- 6 h. p. " " " "
- 60"x210"-54-4" Tubes, Hor. Tubular.
- 72"x189"-35-3 1/2" " " " "
- 60"x163"-54-3" " " " "
- 48"x192"-33-4" " " " "
- 48"x156"-3-3" " " " "
- 44"x142"-42-3" " " " "
- 44"x166"-46-3" " " " "
- 42"x116"-30-3" " " " "
- 41"x156"-43-3" " " " "
- 44"x132"-45-3" " " " "
- 44"x134"-39-3" " " " "
- 38"x160"-36-3" " " " "
- 38"x120"-33-3" " " " "
- 6"x120"-28-3" " " " "

ENGINES

- 4 and 10 H. P. Gasoline Engines, Haggas make, new.
- 1 H. P. Upright Gasoline Engine, Housey make, new.
- 25 H. P. Gasoline Engines, Junction make, new.
- 8 1/2 x 12 Slide Valve Engine, Buffalo.
- 10 1/2 x 16 " " Goldie & McCulloch.
- 12 1/2 x 18 Hor. Rocking Engine, Waterous.
- 9 x 14 Hor. Slide Valve Engine.
- 9 x 12 " " Beckett, New.
- 9 1/2 x 12 " " Northey.
- 4 1/2 x 8 " " Waterous.
- 8 x 10 Centre Crank, Dutton, new
- 7 1/2 x 8 " " " "
- 6 x 7 1/2 " " " "
- 11 x 15 No. 7 Jewel Automatic, Dutton, new
- 10 x 15 No. 6 " " " "
- 7 1/2 x 8 No. 5 " " " "
- 6 x 7 1/2 No. 3 " " " "
- 5 x 7 1/2 No. 2 " " " "
- 4 1/2 x 6 No. 1 " " " "
- 10 1/2 x 30 Brown Engine.
- 10 x 10 Peerless Self Oiling Engine, Leonard.
- 11 x 10 Ideal Engine
- 7 1/2 x 16 and 9 1/2 x 12 Compound Slide Valve Engine, Waterous.
- 70 H. P. Tandem Compound Condensing Engine, Osborne Kelly Make.
- 14 H. P. Engine and Boiler on Wheels, Waterous.
- 10 H. P. " " Cornell.
- 2 1/2 to 4 1/2 H. P. "Triton" Marine Gasoline Engines, Complete With Shaft and Wheel, new.
- 7 1/2 x 8 Marine Engine, Dutton, New.
- 6 x 7 1/2 " " " "
- 3 1/2 " " " "
- 3 1/2 " " " "
- 9 x 7 Marine Engine, with Shaft and Wheel, new.
- 5 1/2 x 7 Marine Engine, with Shaft and Wheel.
- 7 1/2 and 14 x 12 Steep Compound, Doty.
- 4 x 3 1/2 x 4 Fore & Aft, Compound.
- 3 & 5 1/2 x 4 1/2 " " Doty, new.

Prices and Descriptions of the above machinery, also Catalog of Mill and Engineers' Supplies, sent on request. I carry a very large line of iron working tools and am prepared to make close prices on same.

H. W. PETRIE,

131-145 Front Street West, TORONTO
8-21 Station Street,

THE BEST IN THE WORLD

There is no doubt about the fact that the

RODGERS

Adjustable Log Siding Machine

is without a peer.

This machine will slab opposite sides of a log in one operation at the rate of two thousand logs in 10 hours.



A MONEY MAKER

A MONEY SAVER

HUNDREDS OF LETTERS RECEIVED LIKE THIS :

Rock Island, Ill., Nov. 25, 1902.

RODGERS IRON MANUFACTURING CO., Muskegon, Mich.

Gentlemen:—Replying to yours of recent date and referring to your adjustable log siding machine, must say it has given us general satisfaction, and we have done good work with it. And, one desiring a machine of this style for the purpose of slabbing small logs, we would recommend yours.

Respectfully,

WEYERHAUSER & DENKMAN.

For full particulars and literature, mention this paper and address :

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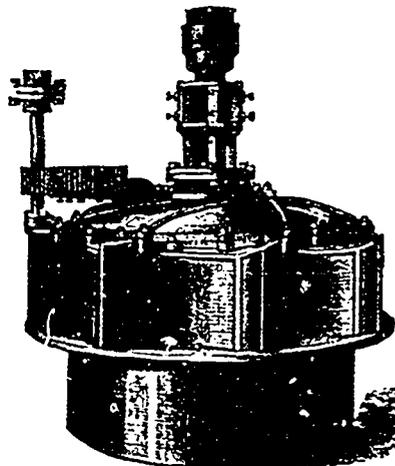
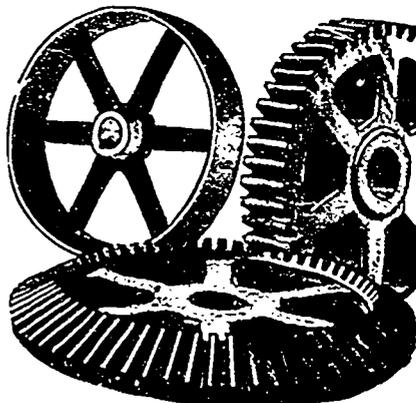
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Hydraulic and Mechanical Engineers, &c.

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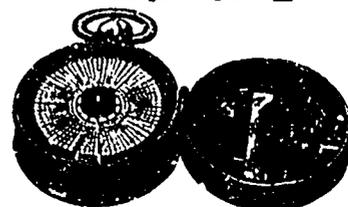
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Contains all the modern improvements. War-rated in every way (cannot be tampered with without detection) Manufactured by E IMHAUSER & CO., 200 Broadway, New York Write for Catalogue Highest Award Pan American Exposition

We Sell Typewriters

\$30.00, \$40.00 and \$50.00 Up

According to the style of machine desired.

We can safely say that our rebuilt typewriters are the best on the market. We use genuine factory parts and employ the best workmen in the business. We also guarantee every typewriter we sell for one year

Price List of Rebuilt Typewriters Sent on Request.

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45 Adelaide Street East, TORONTO.

BARGAIN LIST

Second-Hand Machinery

- 16x36 Brown Automatic Engine.
- 13x30 " " "
- 12x11 McEwen Automatic Engine, High Speed.
- 12x11 Robb Automatic Engine, High Speed.
- 13 1/4 x 30 Slide Valve Engine.
- 8x12 Slide Valve Engine.
- 10x15 Centre Crank Engine.
- 50 h. p. Horizontal Tubular Boiler
- 12 h. p. Fire Box Boiler.
- 8 in. 3-side MacGregor-Gourlay Moulder.
- 7 in. 3-side Cant Gourlay Moulder.
- 3x2x3 Duplex Steam Pump and Receiver.
- Waymoth Gauge Lathe No. 4, nearly new.
- 4 h. p. Electric Motor.
- 1 1/4 Boiler Feed Plunger Pump.

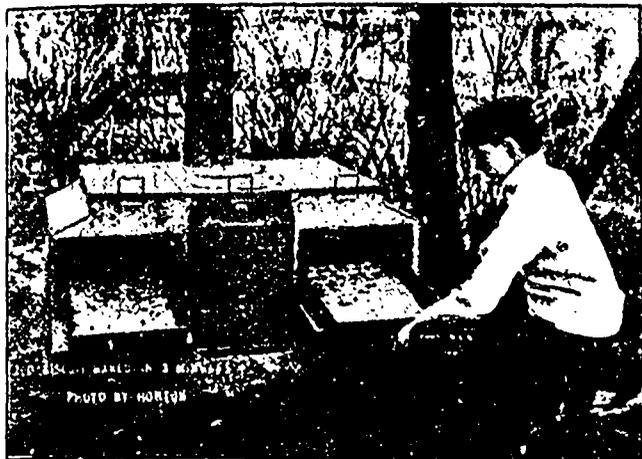
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Laurie Engine Co.

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Watson's Portable Air Tight Baker



The most convenient stove ever constructed for use in the Woods, on the Drive, in the Camps Bakes as perfectly as the finest range.

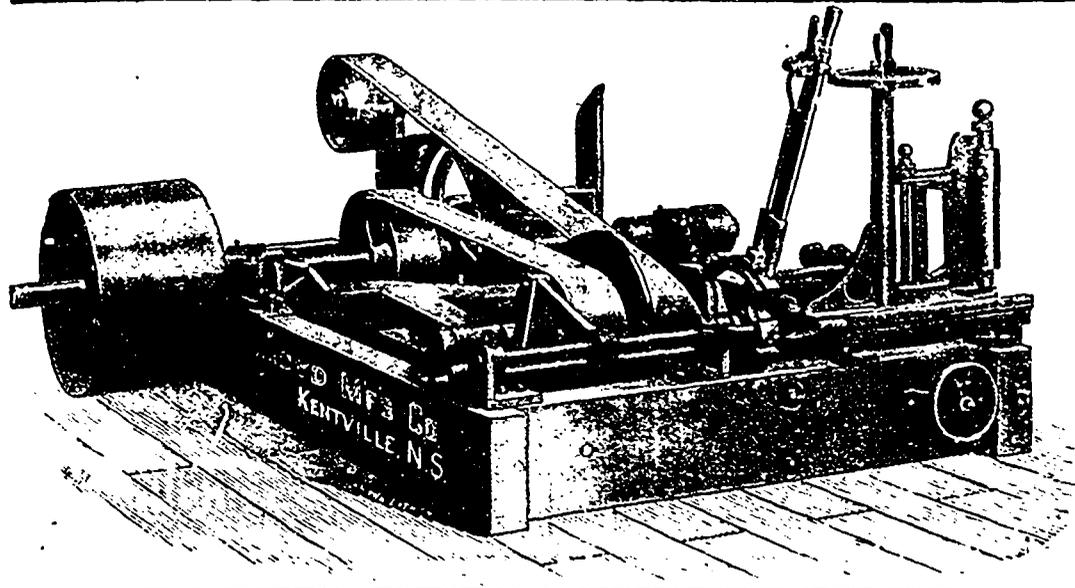
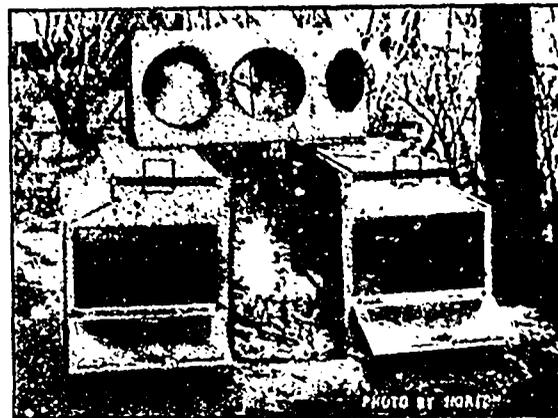
Read What Experienced Woodmen Say of It:
 "We used your Portable Woods Baker all last season with a crew of men in the woods, travelling from place to place. We found it convenient to handle and the best steel range cannot beat it in baking. It is a perfect baking oven and a success in every way."

The cooking is not affected by rain or weather and can be used outdoors or in a tent.

Yours truly,
 MONTGOMERY RIVER BOOM CO.
 Per Wm. H. Stephenson, Gen'l Supt.

We make these stoves in three sizes. Our No. 10 will cook for ten men, our No. 20 for twenty men, and No. 30 for from fifty to one hundred persons. We want those interested in a stove of this kind to write us for full description and prices.

WATSON BROS.
 Manufacturers
 MARINETTE, WIS.



Lloyd Manufacturing Go'y JOHN I. LLOYD, Proprietor.

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Pulp Machinery, Belting, Etc.

OUR SPECIALTIES:

- Band Saw Mill Machinery,
- Improved Rotary Saw Mills,
- with Green Mountain Dogs,
- Also Screw Post Dogs,
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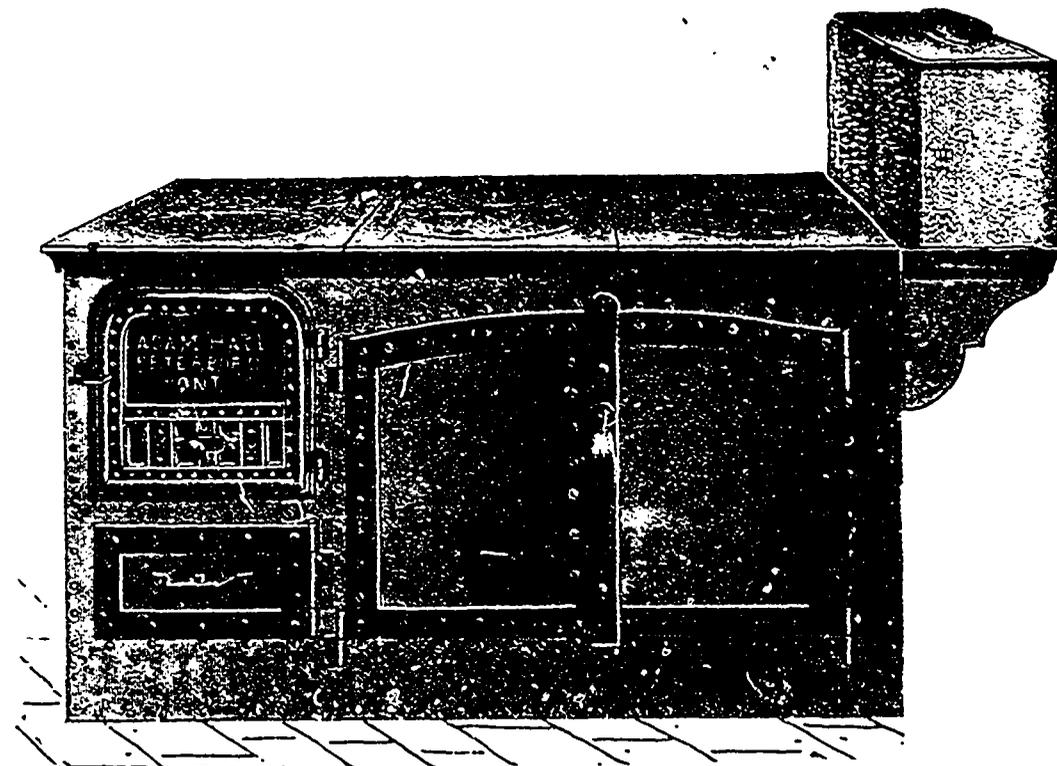
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ADAM HALL, PETERBOROUGH, ONTARIO CANADA.

MANUFACTURER OF

STEEL RANGES

For Lumbermen's and Railway Camps, Boarding Houses and Hotels.



Lumberman's Six Pot Hole Range with Reservoir.

The Lumberman Heater

- 36 Inch Lumberman Heater
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This Heater is used in heating Lumbermen's Camps, Boarding Houses, School Houses and large buildings.

The body of the Heater is made of Heavy Boiler Plate. The ends are made of Heavy Cast Metal, with a large Fire Door.

It is a perfect Heater, and very durable.

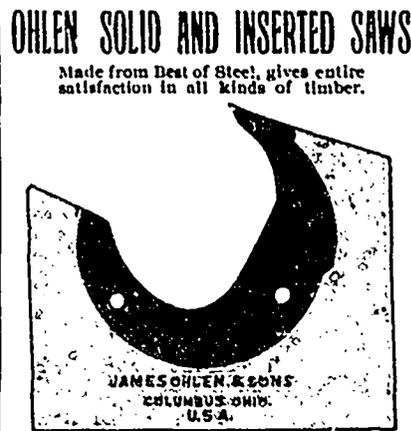
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This No. 10-25 Range with 25 Gallon Copper Reservoir is the one we sell the most of, owing to the convenience of having a supply of hot water at all times. Will cook for 50 to 60 men. Weighs 450 pounds.

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R. SPENCE & CO.,
 Beech File Works
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 FILE AND RASP MANUFACTURERS
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 A trial order solicited. Write for price lists
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 Sovereign Brand
 Highest Grade in Cylinder
 Oils, Engin Oils, Machine
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 POWDERED BOILER
 (THE) COMPOUND (BEST)
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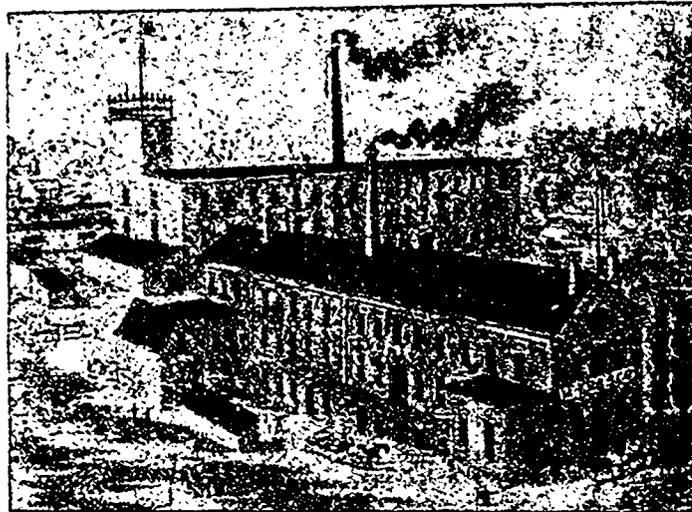
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THE JAMES OHLEN & SONS SAW MFG. CO.
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SPECIAL TO LUMBERMEN AND MINERS



We are Manufacturers of
Mince Meat,
Baking Powder, Spices,
 And all Kinds of Grocers' Sundries
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GLOVES, MITTS, in all Grades of Stock as BUCK,
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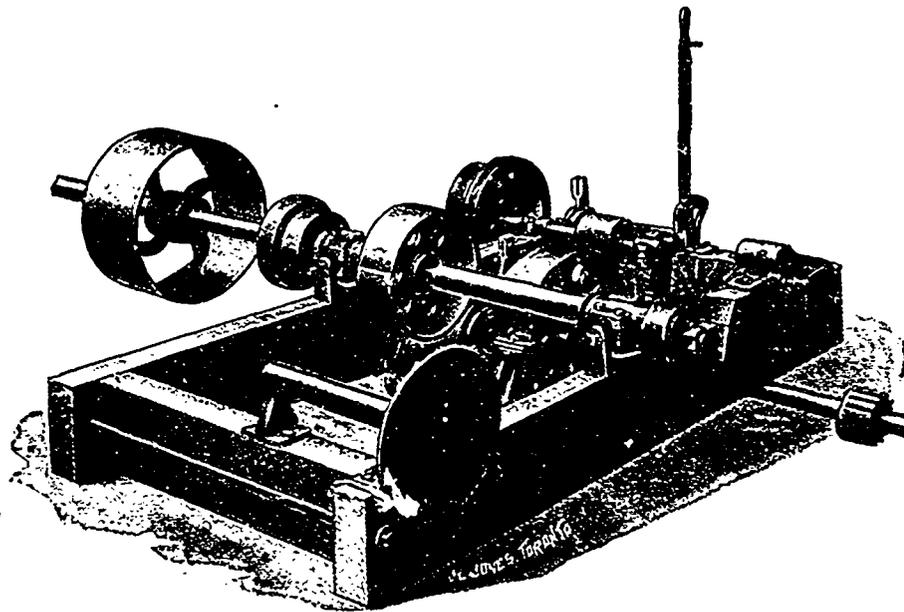
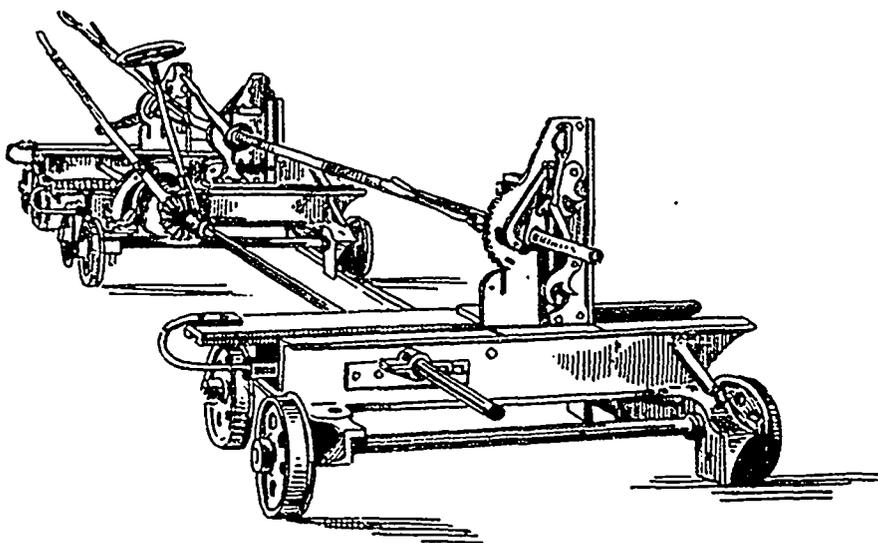
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Correspondence solicited. Samples submitted on application.

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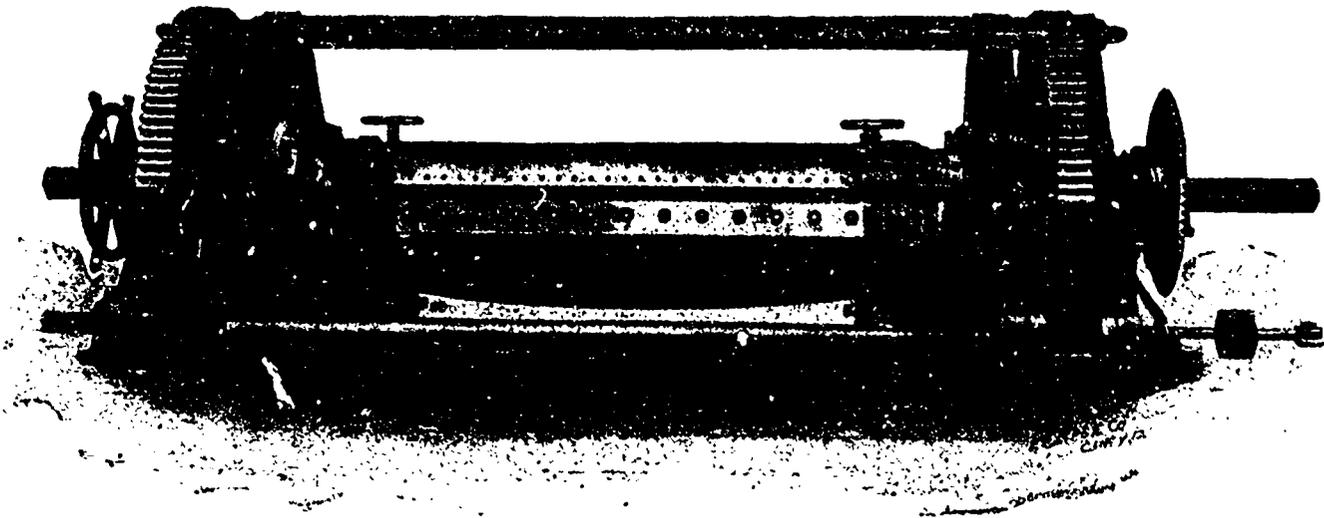
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WHEN IN THE MARKET WRITE US FOR PRICES.

Our Celebrated
Rotary Cutting Veneer Machines

made in over sixty sizes, have stood the test and proved equal to any proposition to reduce logs into thin lumber and veneers.



The product is high grade.
 The output is great.
 The cost of operating and maintenance is reduced to a minimum.
 Quite a combination, is it not?

Timber and mill owners should get in early.
 Buy a Coe Veneer Cutting and Drying outfit and prepare to supply thin lumber and veneers which have a healthy growing demand. More money in it than sawing your logs into lumber.

WRITE US.

THE COE MANUFACTURING COMPANY, Painesville, Ohio, U. S. A.

Established 1852.

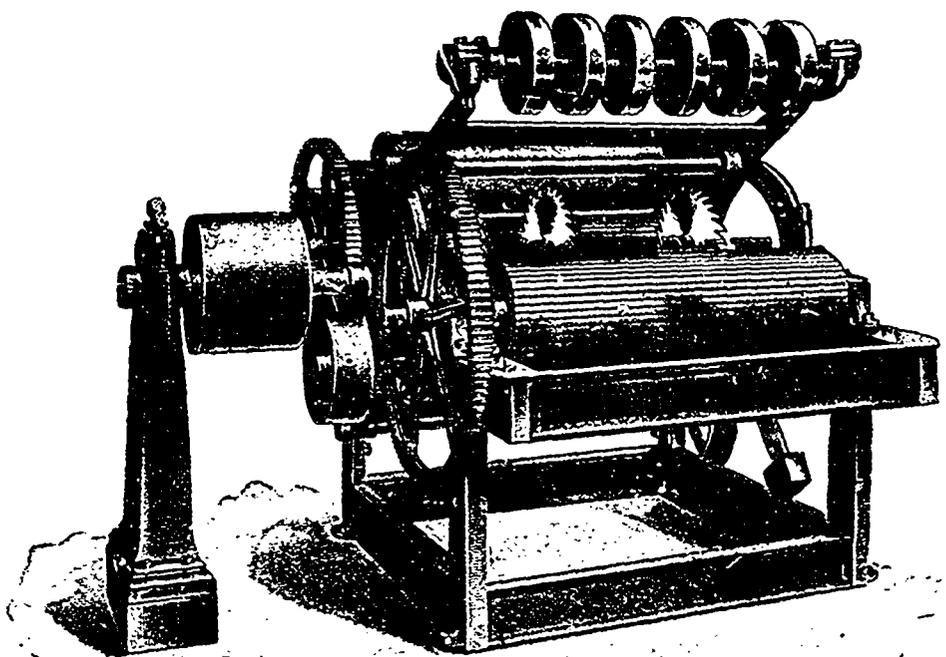
Largest Builders of Veneer Cutting Machinery in the world.

Improved Double Edger

BUILT in sizes from 3 saws up to 8 saws. The front top roller consists of six wheels, space 3 inches apart, thus enabling the operator to see exactly where the saws are. Fitted with one or two moveable saws. By means of removable bracket supporting the mandrel bearing, the entire set of saws can be removed and a new set placed on in a few minutes.

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OWEN SOUND IRON WORKS CO., LIMITED
 Owen Sound, Ont.



Manufacturers of All kinds of **Saw Mill Machinery, Boilers and Engines**

The World-Famous "TOWER" Line of Edgers

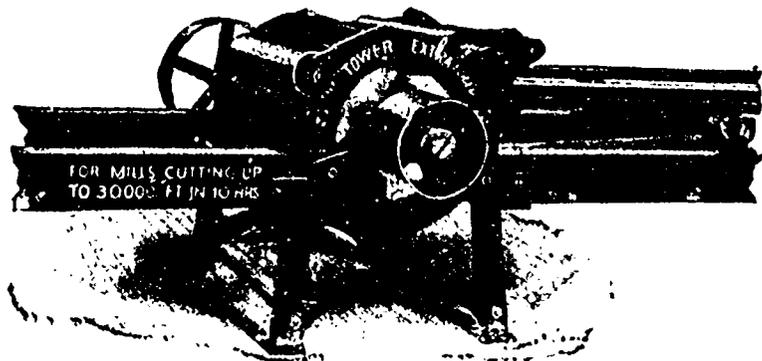
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MADE IN TWO SIZES, AS FOLLOWS:

The "TOWER" 2 and 3-saw Edgers, Improved.
For Mills cutting not to exceed 20,000 feet in ten hours.

The "TOWER EXTRA" 3-saw Edger.

A larger and heavier edition of the "TOWER," for mill cutting up to 30,000 feet.



1. They take up little room.
2. They require little power.
3. The feed rolls are adjustable in FOUR directions, which means absolute accuracy.
4. The saws may be removed easily and quickly, without disturbing the arbor.
5. The mechanism for shifting the saws is up-to-date, convenient and positive.
6. The vital parts are carried by a substantial iron husk resting solidly on the floor.
7. They are pre-eminently practical.
8. There is no edger made approaching them in cheapness.

"The No. 8 'TOWER EXTRA' Edger bought of you in January is immensely satisfactory."
KEO SHINGLE CO., England, Ark.

The "TOWER" One-man 2-saw Trimmer.

With this trimmer one man can easily trim the output of a mill cutting up to 30,000 ft. in ten hours. The shifting crank being secured to one of the chain carriers, the operator shifts the saws as he walks toward the board to be trimmed, thus performing two operations simultaneously. This saves time.

There are two feeds, easily and quickly started, stopped or changed, with outstopping the saws. One lever controls both feeds.

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The Gordon Hollow Blast Grate Co.,

GRENVILLE, MICH.

ESTABLISHED 1859.

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For
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Elevating
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Rubber
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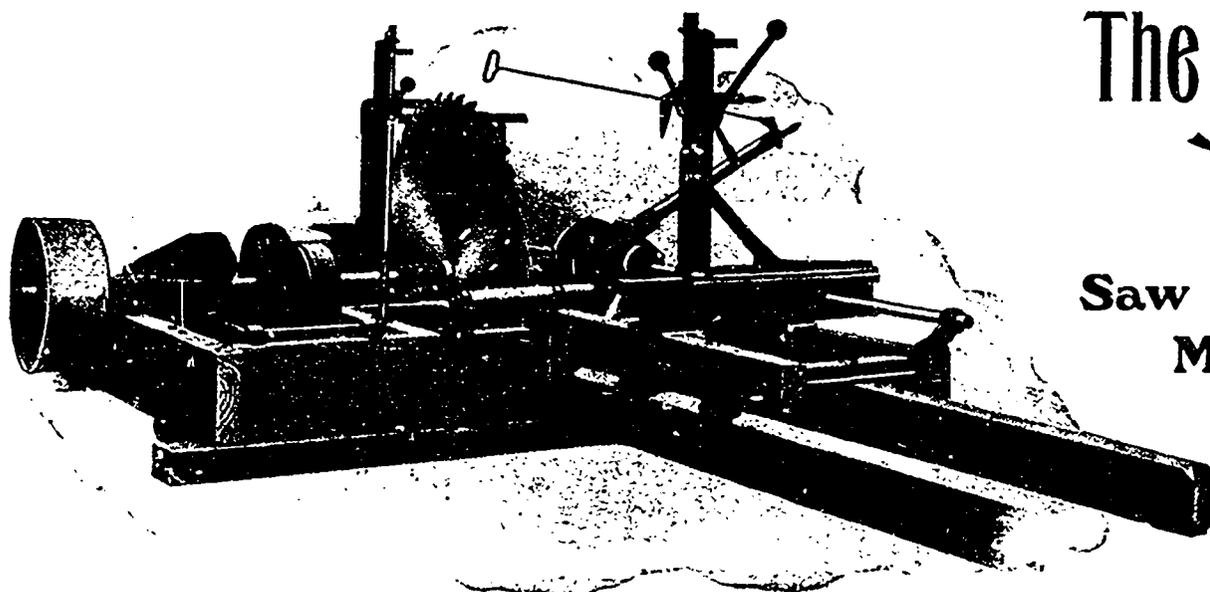
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OF TORONTO, LIMITED.

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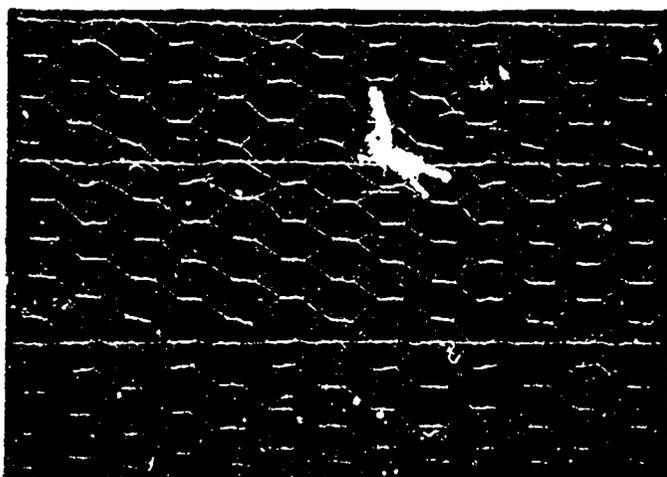
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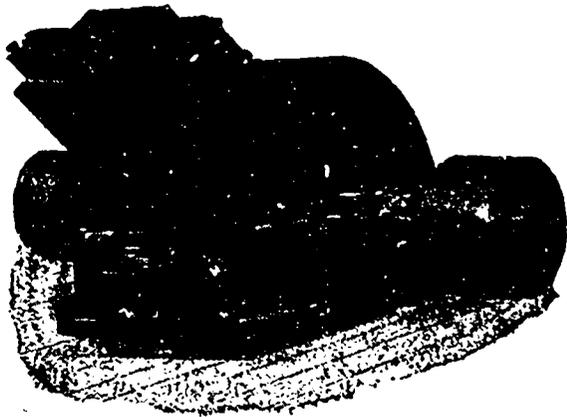
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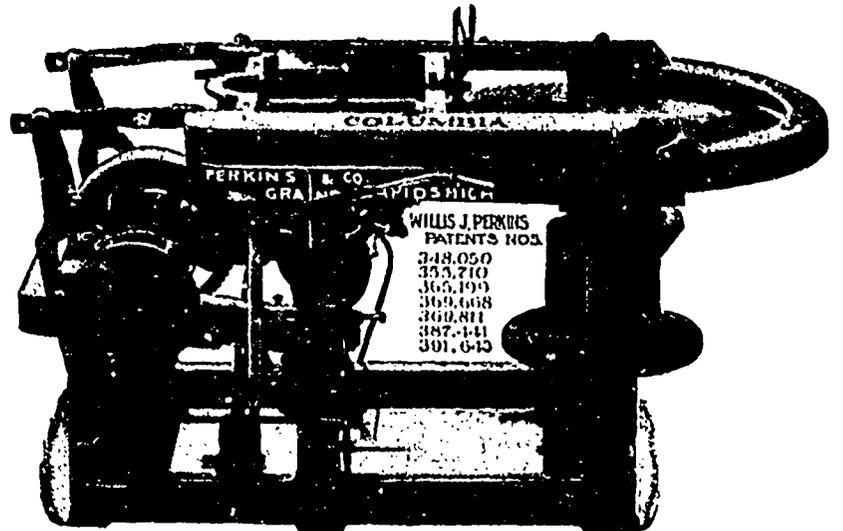
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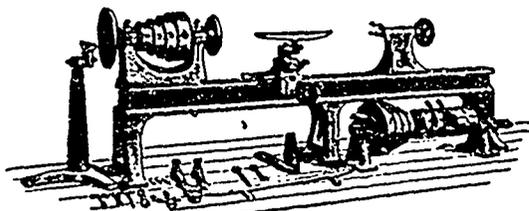
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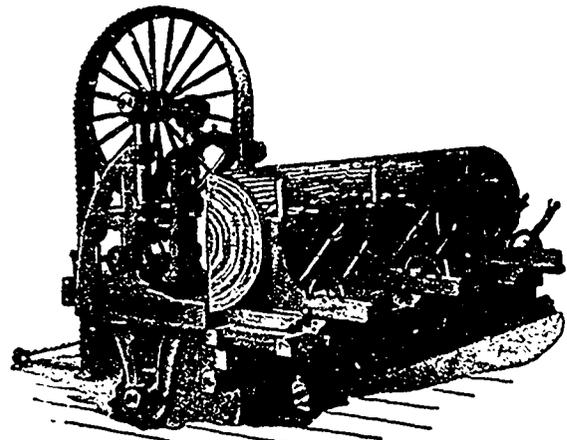
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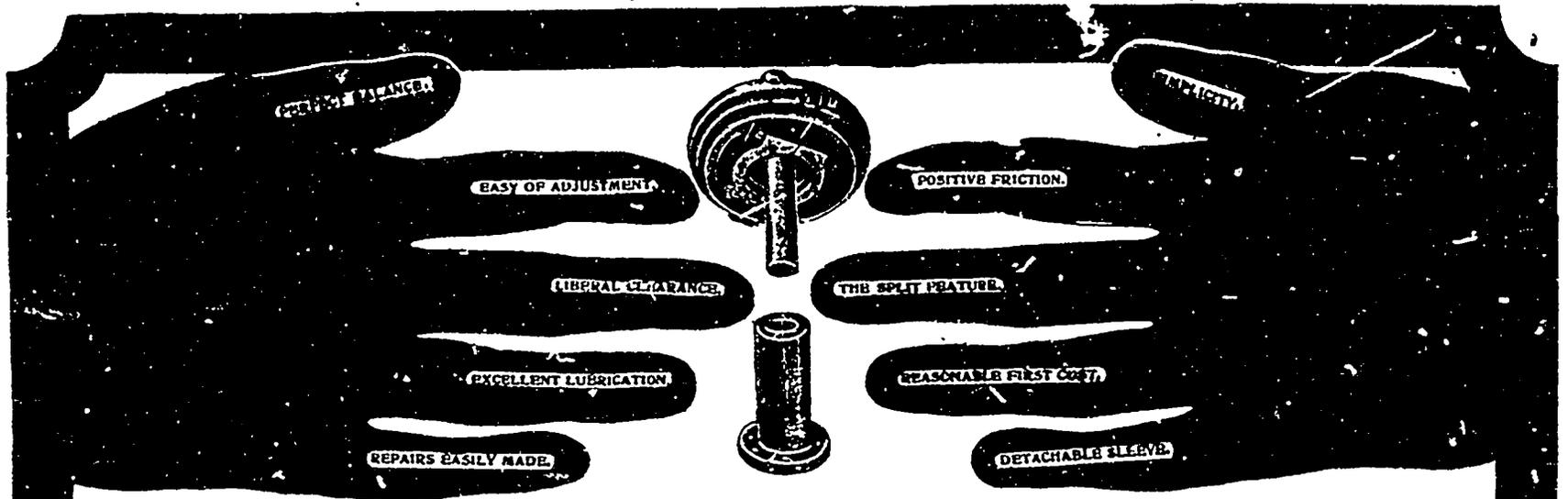
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THE CANADA LUMBERMAN

VOLUME XXIII
NUMBER 7.

TORONTO, CANADA, JULY, 1903

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MODERN PLANING MILL ESTABLISHMENT.

Not long ago a fire in the city of Hamilton destroyed the mill of The M. Brennan & Sons Manufacturing Company, Limited. In the place of the old mill has risen a modern structure that is a credit to the company as well as to the city in which it is located.

The Brennan Company have three yards in Hamilton, employing 75 men, and paying out in wages alone nearly \$32,000 per year. They also have saw mills situated at Rainy Lake, Cache Bay and Spanish River, whilst over two million feet of pine logs were taken out at Tioga during the past season.

The main building of the new mill is 120 x 120 feet, with a dry kiln 35 x 60 feet, and a shavings vault 30 x 30 x 40 feet. The chimney is 90 feet high with a 16 foot base, tapering to 4 feet at the top. In the sheds and yards are carried over five million feet of pine and hemlock lumber. The splendid improved burner erected on the premises was built from plans published in the last October number of this journal. The company are highly pleased with the burner and claim they have one of the best in existence.

Inside the mill are seen a varied lot of up-to-date machinery, including McFahren exhaust fans, S A Woods matchers, pair of Kelly twin engines of 125 h. p. capacity, Goldie & McCulloch

surfacers, Otis freight elevator, Greenlee Bros' relishers, sash stickers, double tenoners, mortisers, shapers, combination and band saws, Jackson & Cockrane sanders, sash joiners, jig saws, boring machines, sash, door and blind machines, etc.

The splendid building is of brick and contains a Goldie & McCulloch vault, with wash rooms and other conveniences for the workmen. The whole is fitted throughout with electric lamps.

Whilst going through the mill our representative was struck by the immense timber and pneumatic hoists in sight and was informed that they were for a large order connected with the new Deering works at Hamilton.

The company are to be congratulated upon the progress made. We have pleasure in giving

a view of the Brennan planing mill, also one showing a portion of one of their yards.

J. R. H.

RAILWAY TIES AND THEIR TREATMENT.

At a recent meeting of the Rocky Mountain Railway Club, Dr. Von Schenck, of St. Louis, delivered an interesting address on "Timber Preservation." Among other things he said was the following:

Abroad, the ties are stacked and dried before being treated. The time varies considerably in the different countries, but is never less than four or six months. This, however, is usually dependent upon the demand for ties. At the impregnating plant of the Great Western Railway, England, the ties are allowed to season

as vital as the impregnating itself. During this seasoning process the water or volatile substances in the wood are given an opportunity to leave the wood under the most favorable circumstances. When once placed in the soil in contact with moisture, the water in the wood has no opportunity of evaporating. In the case of a soluble salt, this leaches out with the greatest rapidity from wet wood, while dry wood is penetrated more slowly by water, and consequently lasts longer. The drying of ties before placing in track might be attended to with excellent results in this country, where no subsequent treatment is given to the timber.

The universal use of different impregnating systems in Europe has brought many of them to a high state of perfection. In England and

France engineers believe that their system gives them the best results, and they use—especially in France—as much of the impregnating material as the timber will hold, saying that the extra first cost is amply paid for by the increased length of life. As has been pointed out this system, which costs from 45 to 80 cents, pays with a tie which costs from \$1 to \$1.40. They know that with this system of impregnation they get about thirty years' life out of their timber.

In many other countries where the price of timber is not so high, cheaper systems

of impregnation are in use, and will continue to be used. Zinc chloride has given good results on some lines, even if it does leach out. Copper sulphate has done so likewise. The new Hasselmann treatment gives promise of good results, and is worthy of more extended trial.

The striking features about the impregnating work as now carried on in Europe may be alluded to again here. They are:

- (1) Seasoning of ties before treatment.
- (2) Strict inspection of ties and chemicals used.
- (3) Injection of larger amounts of chemicals than are used here.
- (4) Seasoning of the treated ties before placing in track.
- (5) Care in all stages of treatment.



PLANING MILL OF THE M. BRENNAN & SONS MANUFACTURING COMPANY, HAMILTON

for six months before treating with creosote. The Eastern Railway, of France, allows from fifteen to twenty months for oak, and six months for beech. They have found out by long experience that it is absolutely necessary that the ties be thoroughly dried out before submitting them to treatment. The piling of the ties so that large air spaces are left around them, gives good air circulation, and thus helps greatly in the evaporation of much of the water. This long seasoning before treatment, almost universally practiced abroad, is one of the greatest factors leading to successful impregnation with methods employing pressure. Its value can hardly be questioned. The seasoning after treatment is fully as important, and perhaps more so. This is a feature not sufficiently attended to in this country, and yet it is almost

THE UTILIZATION OF WASTE AND BY-PRODUCTS.

In the last census report of the United States is an article by Henry G. Kittredge, a part of which is of greater or less interest to the lumber trade. He goes into details as to the various uses that are made of what was formerly thrown into the waste pile at the saw mills, and tells of other articles of commerce that are now extracted from or made of wood that was formerly considered of little or no value. The article is in part as follows:

Nothing in the arts of manufacture is more indicative of economic efficiencies than the utilization of products that have been rejected as wastes or residues in the industrial processes. The acme of industrial economy is the profitable employment of every atom of material in whatever form it may be presented or however obtained. Every particle of an organic or inorganic substance has a useful part to play in contributing to human necessities or pleasures, and when it performs no function toward some useful end, or remains dormant, it shows that the ingenuity and enterprise of man have not reached their fullest development, or that the arts of the laboratory have not revealed all the secrets of nature. The refuse of to-day is a source of profit to-morrow; and this has been going on for years and probably will be going on for years to come, notwithstanding that even now there is little that is thrown aside as absolutely useless, except as it may be utilized in the economies of nature. New revelations and new uses are constantly being found for substances of all kinds, whether in their original forms or in their changed forms, due to outside agencies. The world's increment of wealth is largely dependent upon finding new and more economical uses for materials, however exalted or humble they may be in the industrial scale, and especially the elevation of the humble to a higher plane of appreciated usefulness. If a thing is unused for man's enjoyment, it is because it has not yet found its place of utility.

Nearly all of the formerly waste products of lumber and timber are now turned to some utility, and some of the new products thus formed are of considerable value. Of this latter class may be mentioned sawdust, which was formerly considered an absolute waste material, and was allowed to float down the stream or was thrown into a heap where it could be most conveniently disposed of. French cabinet makers have found a way of using this material which gives it a value

far above that of solid timber by a process that has been in vogue for at least twenty-five or thirty years, combining the use of the hydraulic press and the application of intense heat. By this process the particles of sawdust are formed into a solid mass capable of being molded into any shape, and of receiving a brilliant polish, and possessing a durability and a beauty of appearance not found in ebony, rosewood or mahogany. This product is known as "Bois durci." Artificial woodwork, therefore, seems to have a promising future. Alum, glue and sawdust kneaded with boiling water into a dough, and pressed into molds when dried, is hard and capable of taking on a fine polish. Ornaments of great beauty can be made from it very closely resembling carved woodwork.

The production of acetic acid, wood naphtha, and tar from sawdust is one of the latest enterprises in Norway. A factory has been

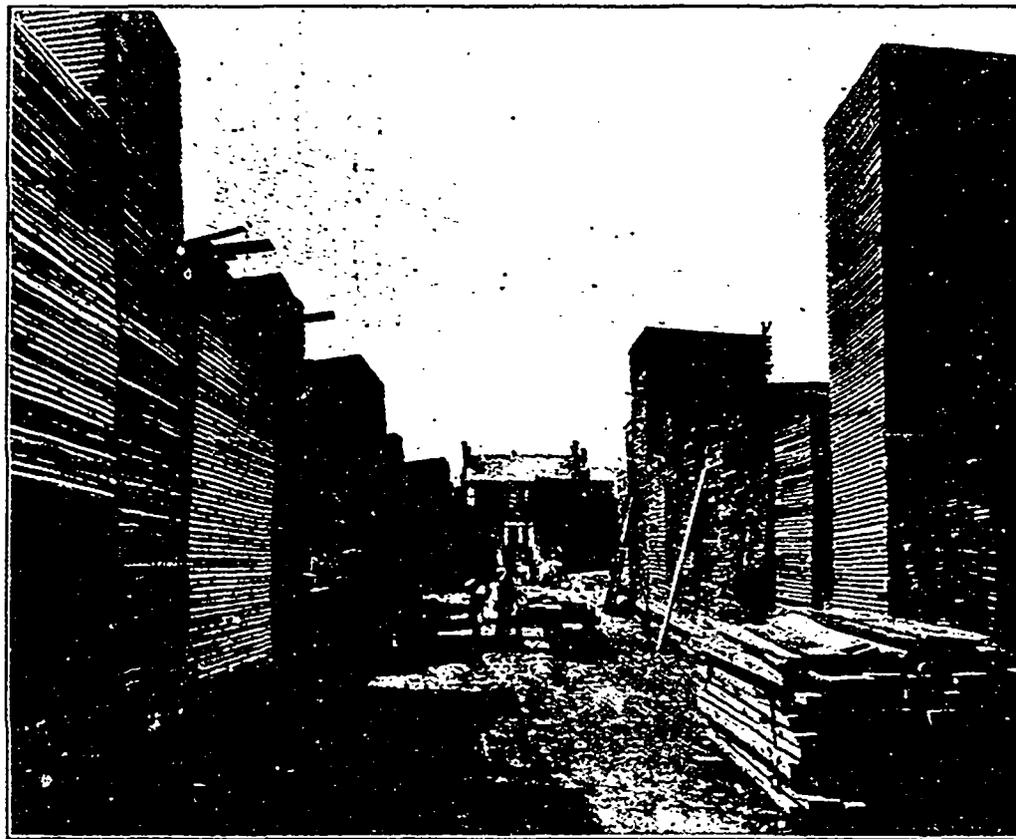
quantity of alcohol obtained from 220 pounds of air dried sawdust (25 per cent. water) was 7 to 8 quarts. The quality of the alcohol distilled from the fermented liquid was said to have been excellent and the preliminary experiments indicated that the trifling impurities found in it could be readily removed.

A patent taken out in England in 1896 for utilizing certain waste products of wood describes a process of constructing or manufacturing a product resembling wood from a mixture of sawdust or wood refuse and certain quantities of gums, resins, or other suitable agglutinants, either in a dry state or dissolved, the compound being subjected to pressure at a temperature sufficiently high to soften or melt the gums or resins.

According to the United States census of 1900 the amount of sawdust used in the clay and pottery industry of this country cost \$19,687, or 0.17 per cent. of the total cost of all the materials used.

The utilization of wood pulp in the manufacture of paper is not new, but its increased use is very marked, as will be seen by comparing the statistics of the census of 1890 with those of 1900, in the amount of raw materials used in the manufacture of paper. Early in 1826 the brothers Cappuccino, paper makers of Turin, discovered a means of supplying the need for paper making material, caused by the scarcity of rags in the fabrication of paper, by substituting the thin bark of the poplar, willow and other kinds of wood. The good quality of the paper made from this material was recognized by the Academy of Science, after an examination of the manufac-

tured product, and so important was the discovery considered that the king granted the brothers an exclusive privilege for ten years for the manufacture of paper from ligneous materials. In 1833 a patent was granted in England to J. V. Desgrand for making paper and pasteboard from wood reduced to a state of paste. Poplar wood was thought at that time the best for this purpose, as it had been in Italy twelve years previous. A patent was granted in 1855 to William Johnson for improvements in the application of various substances containing wood fiber, as the best, or inner bark, of the lime tree, the willow, birch and alder, to the manufacture of wood paper pulp. At the London International Exposition of 1862 Wurtemberg contributed several samples of paper made from wood pulp mixed with rags, the proportion of the former varying from 10 to 50 per cent.; and the paper was reported to be serviceable, although of a low



VIEW IN ONE OF THE YARDS OF THE M. BRENNAN & SONS MANUFACTURING COMPANY, HAMILTON.

started at Fredrikstad capable of distilling 10,000 tons of sawdust in a year. It also manufactures charcoal briquettes, which are exported to the Netherlands. The acids are chiefly placed on the German market, while the tar is mostly consumed at home. The factory is said to be the first of its kind erected in that country. According to an English patent of 1897 sawdust may be so prepared as to be non-inflammable, and then applied to jacketing of boilers and other purposes.

In the Journal of the Society of Chemical Industry for 1898 is described a series of experiments for obtaining alcohol from either coarse or fine sawdust, without affecting the yield. It was found that pine sawdust, as compared with fir sawdust, was superior, as yielding a purer alcohol. It was also found that a high yield of sugar was obtained from birch sawdust, the yield of sugar being about 30.8 per cent. of the quantity of birchwood used. The

grade. The wood was simply rubbed down into a pulp against the periphery of a wheel prepared with a rough face. At the Paris exposition, 1867, was to be seen in action a large machine of 50 horse power for making wood pulp for paper. Only whitewoods were thought to be available for the purpose.

LARGE LOGGING ENGINE.

The accompanying illustration represents what is said to be the largest logging engine yet turned out in British Columbia. It was manufactured by the Vancouver Engineering Works for the British Columbia Mills, Timber & Trading Company. The engine has cylinders of 10 inches in diameter and 15 inch stroke. It is very strong throughout, the frame being built up of 15 inch steel I beams. The main drum has a capacity of 1½ miles of ¾ cable and the haul-back drum a capacity of 3 miles of ¾ cable. The boiler is 60 inches in diameter by 132 inches high and carries a working pressure of 150 pounds of steam. The front drum of the engine is fitted with the McNair patent device for setting the friction. The weight of the engine is about 17 tons.

CARE OF BOX MACHINERY.

Regarding the care of box machinery, a writer in the Woodworker says:

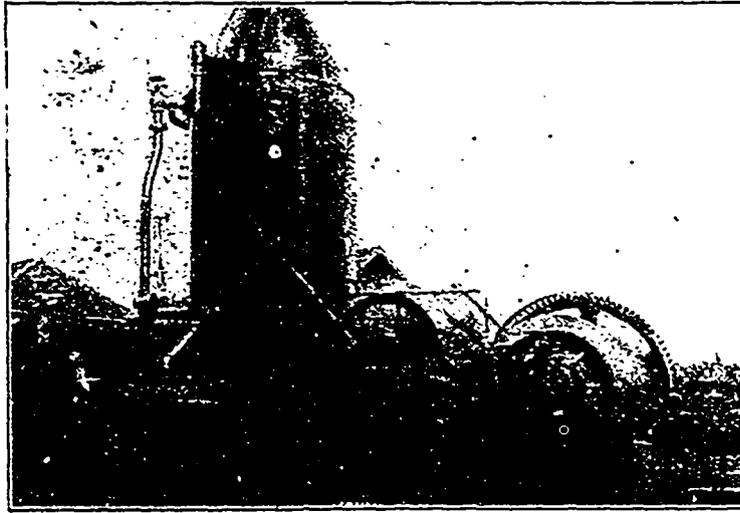
I recently suggested that some improvement could be made to a surfacing planer by having two cutting heads on the top of the smoother—two cylinders of two knives each, instead of one cylinder of four knives, with the front one raised a little so as to divide the cut between the two heads. This I suggested for two reasons: First, because it would give us four driving belts instead of two, which would insure against choking down when a lumpy board came along, and second, because the front head would then get the bulk of the dirt and grit from the board, making it easier to keep the back cutter in shape for smooth finishing than would be possible if there were but one head on the machine.

A question which came up was in relation to the bottom cutter; a reader wanted to know what was to be done with that part of the machine.

If you follow closely the passing of stock from the yard to the sawing machine, you will find that quite a general practice is to do the resawing first, and then run the boards through the surfacer. Further, when those boards go through the planer they have this freshly-sawed part turned down, and the dirty and lumpy work comes to the top cutters, where I suggested doubling up. Also, it is not at all unusual to not only turn the freshly-sawed side down, but to also let it go at that without any planing at all, so that the case is rather frequent where only one side is surfaced at all, and that is almost always the top side. Then, if it should be desirable at some time to run thick stuff and surface both sides, the top is where the burden of cutting in case of uneven thickness rests,

for the board is held firmly in relation to the bottom cutter by the platen and feed rolls, and there can be no variation of the cut there during the running of a board, no matter what it may vary in thickness. I repeat, then, my suggestion that some improvement could be made in the ordinary smoothing planer practice by having two cutterheads for top surfacing and distributing the work of four knives to two heads and four belts, instead of one head and two belts.

This year there is particular need for the very best of facilities for matching up of box boards. I do not mean the tongue-and-grooving, but the fitting together at the saw table of such widths as are required to make up a box side, for the scarcity and high price of lumber has led to the use of smaller pieces of scrap, and has practically doubled the work in this line. While it is all right to save timber, and some might well have learned the lesson sooner, it is well, too, to see that it is saved without costing more in labor expense than the timber is



LARGEST LOGGING ENGINE YET BUILT IN BRITISH COLUMBIA.

worth. I have seen a man stand at a little table rip saw with his gauge set for the width that it was desired to make up, which might be of any number of pieces, and when a piece came along that had no good edge to work from he would slide it alongside of the saw and trim it on one edge, trusting his eye and his hands to get a straight, even cut. Now, no matter how good a man's eye may be, or how deft his hand, it takes up some time to do this, and it cannot be as satisfactorily done even then as it would be if there were some guide for the work; besides, there is an element of danger in this work that might as well be reduced.

For doing work of this kind one should have a saw frame with that part outside the saw line sliding like a carriage, and if he has not he should work one of his table saws over and get some kind of a sliding arrangement here. Let the inner part of the frame, where the gauge is set, and where the box side is cut to size, remain as it is if desired, but be sure and get some sort of a carriage on the outside of the saw so those pieces that have to have an edge trimmed can have it done in a business-like and satisfactory manner. When the thing is once tried the advantages will soon become apparent. Another thing worth trying on these

little table saws is, if you have a wooden top try covering it with sheet steel; it will not only make a better working surface, but it will also insure a long life to the table top.

When you refit those little saws, do not get the idea that they are good for an indefinite period of service without attention, and leave them at that, for they require certain small attentions every day, which, in the aggregate, are of as much importance as the refitting of the machines themselves. Do not think they will run if the operator will only squirt a little oil at them semi-occasionally, but see that they are provided with oiling facilities, and then see that they are oiled regularly. I have seen such rigs in operation, and by-and-by have seen smoke rising from the journals; the result would be from two hours to half a day's time lost that need not have been if they had been anything like properly lubricated.

Not only is it of importance to give attention to the oiling of these and other machines in the factory, but they should be kept from getting clogged with dust and dirt till it is almost revolting to have to examine the interior of the machine. Do you ever get affected with the cleaning-up habit? Do you have the machines in the place cleaned regularly, and try to induce the men to take some interest in the outward appearance of the machinery? If you do not, you ought to try it at once. Do you just let the machines go because you think you cannot spare the time and expense of cleaning up occasionally? If you do, you ought to try a change for luck, and see if what you first looked at as a loss of time does not really prove to be time well spent.

I saw a young foreman inaugurate a plan along this line one time that struck me as being good enough to mention, that others, who have not yet taken up this subject, may get some idea therefrom. The shop was an excellent one, so far as the building itself was concerned, and, as a rule, the floor was kept nice and clean, but the machinery was being run without any set period for cleaning up, which had resulted in leaving most of it in a shape that a cleanly man would abhor.

An idea struck the foreman and he passed around the word to every operator to stop at 15 minutes before quitting time on that (Saturday) evening and devote 15 minutes to cleaning up his machine. Promptly at the time mentioned every man flew to cleaning up his machine and putting things to rights in his individual part of the shop, and the following Monday morning things presented a better appearance than they had at any previous Monday that I had seen the shop.

A copy of the 1903 catalogue of Messrs. Wm. B. Mershon & Company, Saginaw, Mich., entitled "Use and Care of Band Saws," will be furnished to all interested persons upon application. The hints on the care of band resaw blades, and numerous tables, render it a valuable book for reference. The firm make a specialty of band sawing machines carrying extra thin blades.

THE Canada Lumberman

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THE CANADA LUMBERMAN is published in the interests of the lumber, wood-working and allied industries, being the only representative in Canada of these important interests. It aims at giving full and timely information on all subjects touching these interests, and invites free discussion by its readers.

Special pains are taken to secure for publication in the WEEKLY LUMBERMAN the latest and most trustworthy market quotations throughout the world, so as to afford to the trade at home and abroad information on which it can rely in its operations. 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.

Advertisers will receive careful attention and liberal treatment. For manufacturing and supply firms wishing to bring their goods to the attention of owners and operators of saw and planing mills, wood-working factories, pulp mills, etc. the CANADA LUMBERMAN is undoubtedly the cheapest and most profitable advertising medium. Special attention is directed to "WANTED" and "FOR SALE" advertisements, which are inserted in a conspicuous position on front page of the Weekly Edition.

THE COMMERCIAL OUTLOOK.

The almost entire absence of failures in the lumber trade is proof of the prosperous condition of the industry. The average business is being conducted at a profit and should at the close of this year again show a balance on the right side. The making of large profits, however, has been rendered more difficult, if not impossible, by the increase in the cost of stumpage and of logging. A few years of prosperity were due the lumbermen of Canada, and if the present good times should continue for some years yet, they would bring but a deserved reward for the many years when lumber barely brought the cost of production and more than one business concern was forced into bankruptcy.

What shall be the trend of commercial events in Canada during the next few years is a question that is much discussed. Some predict that the height of prosperity has already been passed and that a gradual falling off in business may be expected. The magnificent showing made last month by the export and import returns does not indicate such a result. Inquiries made of manufacturers of machinery reveal a healthy condition of trade. Some of the largest manufacturers have orders on hand which will take the bulk of their output for twelve months to come. This would seem to indicate confidence on the part of the people, for if they believed a wave of depression was on the road, which would certainly bring with it lower prices for products of all kinds, they would not place orders at the prices of to-day.

"In times of peace prepare for war" is good advice. Periods of depression will doubtless be experienced, and it may be unwise to be too optimistic in respect to even the near future. Nevertheless, it seems extremely doubtful that

we shall again witness in the same degree the stagnation to trade which characterized the early nineties, for the development of the resources of Canada has only commenced.

The breach between capital and labor has seemed to widen with the better times, for in no year, perhaps, has the business of the country been more disturbed by strikes. Doubtless the employees have not always been at fault, but on the other hand there have been many instances where labor has made unjustifiable demands. If the aggressiveness of labor organizations is to continue, we see in it one of the surest signs of the return to the hard times and over-stocked labor market of ten years ago.

TREATMENT OF TIMBER.

The hope of an ample timber supply for future generations lies largely in the education of the people to the necessity of preserving and protecting the standing trees. It is not alone in this respect, however, that we can foster our supply, for the treatment of timber in a manner to prolong its life is a most important agency towards perpetuation. So far in this country very little thought has been given to any artificial method of timber preservation, owing to a lack of recognition of its necessity.

To Dr. Martin Murphy, of Halifax, N. S., belongs the credit of endeavoring to awaken the interest of Canadians in the subject. In his presidential address before the Canadian Society of Civil Engineers, he presents some statements which show that it is most expedient to prolong the life of railway ties, wharf piling and other timber by means of creosote or other similar material.

The average life of a railway tie in Europe is about twenty-four years, while that of a spruce or hemlock tie in this country is from eight to ten years. In Europe the ties are treated by creosote, which apparently doubles their life. It would seem to be a fallacy to consider that the ties used in this country could not be effectively treated in a similar manner, thus effecting a very large saving in the consumption of timber.

Dr. Schenck, of the United States Bureau of Forestry, is also an advocate of the seasoning and creosoting of timber. The main advantages of seasoning are that the timber lasts longer, since the water in green timber is necessary to the life of decay-producing fungi; that it greatly increases the effectiveness of the preservative treatment, and that by reducing the weight of timber it causes a corresponding saving in freight.

An interesting fact, recently discovered, is that high grade timber, such as white pine or oak, is not so readily penetrated by the preservative fluid as is timber of poorer quality. This is due to its greater density.

Reverting again to Dr. Murphy's address, he points out the need of large plants along our coasts for creosoting heavy timber. The cost, he admits, would not be warranted by the amount paid annually for imported creosoted timber, but would be saved many times over by the cost of renewals, which would be greatly reduced by the application of creosote.

The subject seems to be of sufficient import-

ance to receive consideration at the hands of the Government, who in our opinion should undertake experimental tests with a view to convincing the public of the benefits to be derived from the artificial treatment of timber.

BOARD MEASURE.

One might reasonably suppose that a term that is so universally used by the lumber trade as is "board measure" is entirely free from ambiguity as to its meaning. It is only necessary to obtain the opinions of a few persons to find out that its real significance is by no means clearly understood. It has been the subject of litigation on more than one occasion, and it is doubtful whether the meaning of the term in all its applications has yet been clearly defined.

Board measure is based on a square foot 12x12 inches by one inch in thickness. Material thicker than one inch is reduced to the inch basis. Thus a board twelve feet long, twelve inches wide and one and one-half inches thick would contain eighteen feet board measure. The accuracy of the method by which the above result is obtained is unquestioned. The proper measurement of pieces less than an inch in thickness, however, brings up the question upon which opinion is divided. By some it is contended that no allowance is to be made for the deficiency where a board is less than an inch in thickness, that is, that a board twelve feet long and twelve inches wide contains twelve feet board measure even if only one-half inch thick. The American Lumberman holds this view, at the same time pointing out that it is an inconsistency of the board measure system that is misunderstood. On the other hand, so great an authority as Mr. W. B. Mershon, of Saginaw, claims that lumber thinner than 1 1/2-16, which is the thinnest standard for dressed inch, must be taken as surface measurement, the price being based on so much a thousand feet surface measure, regardless of the board measure. He argues that if lumber 3/8 or 1/2 or 5/8 inch thick counted for inch stock, a person could buy one thousand feet board measure of 1 1/4-inch lumber, resaw it with a fine resaw and leave it nearly 5/8-inch thick, and he would at once produce 1,600 feet board measure. Mr. Christodoro, the author of a well-known box reckoner, agrees with Mr. Mershon's contention.

Even at this late date it would seem very desirable that a proper determination of the term "board measure" should be made by some high tribunal, for as matters now stand the trade are loath to accept either of the existing definitions.

EDITORIAL NOTES.

Dr. J. F. Wilson, Secretary of the National Nut Growers' Association of the United States, has contributed to the Nut-Grower an exceedingly timely article entitled "Nut Trees for Timber." Dr. Wilson points out that the hickory, chestnut and walnut trees are very valuable for their timber, and will incidentally produce a by-product in the nuts grown, thus making such plantation a profitable investment years before its maturity for lumber. The

excessive cost of hickory, chestnut and walnut lumber is also an argument in favor of planting trees of these varieties. With a prospect of ultimate direct and indirect profit and assurance of dividends from such trees during the waiting periods for a lumber harvest, the subject seems worthy of consideration to those who contemplate reforestation.

The veneer door is becoming very popular. The public have learned to appreciate the advantages it possesses and no longer demand the solid hardwood door. In point of lightness the former has a decided advantage, and as the veneer door is now made it cannot warp nor crack. It has been more difficult to introduce hardwood veneer in furniture, but even the prejudice against this is passing away.

Every owner of timber stumpage may feel assured that sooner or later his timber holdings will become very valuable. One by one the so-called valueless woods come into prominence. Just now hemlock is demanding attention as never before. Not long ago regarded as barely worth the time necessary to put it in marketable condition, to-day it is being shipped in deal form to England, and has probably not yet reached its proper status in the timber field.

Considering the large number of persons engaged in the lumber trade of Canada, how little sociability appears to be manifested. In reality there exists as much friendship among the individual members as in other branches of business, but there has been lacking an opportunity of cultivating that friendship. Doubtless it would be found profitable and pleasurable if, as is done in the United States, trade luncheons were held in the cities where a number of lumbermen could assemble. During the present summer let a social function of some sort be arranged which will bring together in a friendly manner the many lumbermen who make their headquarters in Toronto and those at adjacent points who may be able to attend. It might prove to be the forerunner of regular fortnightly or monthly meetings where trade matters could be discussed in an impromptu manner and views exchanged on lumber subjects. The CANADA LUMBERMAN would be happy to chronicle the formation of a lumber exchange in Toronto. And not alone in Toronto is there scope for such an exchange. Wherever a number of lumbermen are located means should be provided of meeting together and profiting by an interchange of ideas.

EARLY SAWYERS AND HEWERS OF SAW-LOGS.

The lumber sawyer and the log hewer were of the utmost importance in early colonial days. There were no saw-mills in New England, nor in New Amsterdam until 1633, and it was many years after this before they became sufficiently numerous to make "pit sawing" unnecessary. So scarce and high-priced were saws that sometimes even pit sawing was impossible, and towns sprung up built of log houses with split shingles, too far in the frontier even to have a board. The town records

of a village in Oneida county, New York, show "the first death in the settlement, a child, buried in its cradle, there being no boards to make a coffin."

Pit sawing was done by two men with a long saw that had cross handles on each end. The log was first hewed square and then either placed over a pit dug in the ground or it was elevated on trestles. The best workman stood on top of the log and pulled the saw up, at the same time guiding it along a chalk line. He was called the top sawyer; the other man, less skilled, pulled the saw down and was called the pit man, says M. E. Stewart, of the U. S. Department of Labor, in a recent article.

Top sawyers were paid 33 $\frac{1}{3}$ cents a day in New England in 1630; pit men received 25 cents; or where board was furnished they received 25 cents and 16 $\frac{2}{3}$ cents respectively. When working by the piece they were permitted by "the court" to charge 75 cents a hundred feet for boards "at six score to ye hundred (that is, 120 feet) if the wood be felled and squared for them." If the sawyers cut the trees and squared their own logs they might charge 92 cents for 120 feet. This court regulation did not last long and by 1639 sawyers got \$1.08 for this work.

Late in the year 1621 the Plymouth colony sent the small ship *Fortune* of fifty-five tons burden to England, loaded with hand-sawed "clapboard as full as she can stowe and two hogsheads of beaver and other skins." The value of the cargo was said to be \$2,000. This was the beginning of New England's foreign commerce. Virginia had been exporting shipments for some time.

In New Amsterdam the wages of top sawyers was 50 cents and pit men 40 cents a day, and this continued to be the rate of wages in saw-mills after they became quite common. Although Manhattan was settled in 1614, the West India Company did not see fit to erect a sawmill until 1633. It is not strange that none was erected in New England until the same year, for there was none in England for over 100 years after this; but the Hollanders in Manhattan must have seen mills in their native land, and so had the Swedes who first settled Pennsylvania. The Swedes had a sawmill before the landing of Penn. The greatest drawback was the scarcity of tools, for even as late as 1792, when the first sawmill was built in Rensselaer county, New York, by a millwright named Cross, he "had no tools but an axe, saw and auger." The wages of millwrights were then \$1.50 a day in New York and from \$1 to \$1.17 a day in Massachusetts.

In a list of articles to be sent to the Dutch colony on the Delaware in 1662 we find the "iron works for a saw mill" charged at "450 florin," the equivalent of \$180. A completed mill sold in Massachusetts in 1684 for \$337. A sawmill of that value was able to cut about 1,000 feet of boards a day, a day being from sunrise to sunset.

The colonies hedged these sawmill franchises around most carefully. So characteristic of the colonial idea of the rights of the community as against the individual interest are these regulating franchises that one of them is here quoted. Permission was given three men by the

town of Scituate, Mass., to erect a sawmill. The document is dated Nov. 10, 1656, and the mill must be finished within three months from that date. The regulating clause reads: "That in case any of the townsmen do bring any timber into the mill to be sawed the owners of the mill shall saw it, whether it be for boards or plank, before they saw any of their own timber, and they are to have the one-half for sawing the other half. And in case any man of the town that doth bring any timber to the mill to be sawed shall want any boards for his particular use, the owners of the mill shall sell him boards for his own use so many as he shall need for the country pay (farm produce) at 58 $\frac{1}{3}$ cents an hundred inch sawn; but in case the men of the town do not supply the mill with timber to keep it at work the owners of the mill shall have liberty to make use of any timber upon the common to saw for their benefit."

One peculiarity of these regulations always is that a higher price may be charged to people who do not live in the town granting permission to build; also that work for "strangers" must not be done at this advance price if any ownsmen wants work done at the lower price.

New York was equally careful to secure favorable rates for the people of the granting town as against outsiders, even where a fixed rate was not named. In 1673 Oyster Bay gave a right to James Townsend "and his heirs forever" to cut and use any timber they found on the commons and sell the lumber to any one, whether in the town or out of it. But Jamaica, a town in the same county, granted in 1673 to Carpenter & Carman permission to erect a mill and use timber from the common land "except clapboard and rayle trees under eighteen-inches, provided they saw for the town 12 pence in the hundred cheaper than any other persons of any other town; and for citizens of the town that bringeth the timber one-half of the sawn stuff for their labor, provided that it is only for their own use." Jamaica did not like the Oyster Bay franchise.

New England seems never to have granted any rights to a man "and his heirs forever." The objection to primogeniture and entail came as ballast in Mayflower. Some of the quaker colonies stipulated in their saw mill franchises that the owners must saw boards for Indians for their own use free of charge.

These mills had but one upright saw, the blades being attached directly to the low frame and rendered steady by side pressure from guide blocks. The first mills built both in Manhattan and in New England were driven by wind; later by water power, a rude and small overshot wheel being used.

Hand sawing was by no means done away with by the introduction of these crude saw mills. Many of them would not take a log long enough to make sills and beams, and all the heavy timber continued to be sawed by hand. In the white-pine districts of New York the trees were so large they could not be handled by the early mills.

The Rainy Lake Pulp & Paper Company, whose concession was recently approved by the Ontario Legislature, has been granted incorporation, with a capital of \$500,000 and head office in Toronto. The provisional directors are: Hon. Geo. E. Foster and W. J. Elliott, Toronto; William Blackwood, Winnipeg; W. A. Preston, Mine Centre.

THE COST OF WOOD WORKING.*

In this article the desire is to present for the consideration of manufacturers a system which will simplify the keeping for ready reference the cost of the manufacture of any article or set of articles. While a wood-working plant is under specific discussion, it is merely by way of illustration, and it can readily be seen that the

be told by the workman detailed, and foremen should be instructed to refuse to receive any job from another department without the ticket attached.

TIME CARDS.

One of the essential points in the cost of the manufacture of an article is the time a workman consumes in its construction; often it is of far greater importance than the actual cost of material. In order to properly arrive at that point the adoption of a time card is suggested. This card may be printed in the form of the dial of a clock (Figure 11). This plan is suggested for the reason that the most illiterate workman is able to tell time, and his only task need be to place a cross in the hour when he begins work on an order, and another when it passes from his hand. Thus the exact time required for work in each department through which it passes may be at once determined. Different forms should be provided for each department,

given period of time, and the non-productive labor for the same department amounted to \$100. By dividing as stated above the result would be 10 per cent. Therefore to the cost of the productive labor add 10 per cent. to cover the cost of the non-productive labor.

CUTTING RECORD.

There should be turned in each day by the foreman of the machine room the exact amount of rough lumber cut. This should include all scrap and waste for each order number.

In keeping a stock record a card should be made out for each kind of lumber, the cards to be filed between suitable guide cards (Figure IV). When lumber is received it is entered on the card in the proper column, noting the date, from whom received and the amount. The daily reports turned in by the foreman of the cutting room should show the amount of stock cut for each order, and from his reports the amount of stock could be entered. When an order is made out in the office the actual net amount of lumber needed for its construction is determined and entered in the proper col-

ORDER NO. 4871	SHOP ORDER 624 A	SHOP ORDER NO. 57
TO P. H. Nelson	FOREMAN Cabinet	DEPT.
MAKE 522 drawer sides for #35 26110		
WHEN COMPLETED RETURN TO Oliver Room		
DATE OF ORDER	DATE BEGAN	DATE FINISHED
SUPT.		

FIGURE I.

principles involved may be carried into any line where system is desired and with the same satisfactory results.

ORDERS.

It matters little what the nature of the article may be, all goods manufactured should be constructed from blank orders which should be furnished to the foreman of each department through which an order passes. The form suggested for this purpose (Figure 1) may be adapted to varied requirements. At the completion of a part of the order in any department it receives the O.K. of the foreman, and is sent along to the next department and so on until the work is finally ready for delivery. This enables the office to at any time learn the exact position of the order without searching through the factory for the desired information. The endorsement of the last foreman having

as they differ in the operation, but each should retain the chief points; the order number, job number, date commenced, date finished, name or check number of workman, number of pieces and the name of the article. Cards for the cabinet room would have the possible operations printed along the side of the card, and similarly in all of the departments. The idea which it is wished to convey will be found illustrated.

These time cards should be deposited in pockets attached to each machine and should be numbered according to the machine number in order to prevent confusion. Then when a workman starts a job he has but to enter the job number on a card and cross the time when he commences his work. The illustration (Figure III) shows one of these pockets in use. He enters his name, or, if he cannot write, his check number, runs a line through the operation

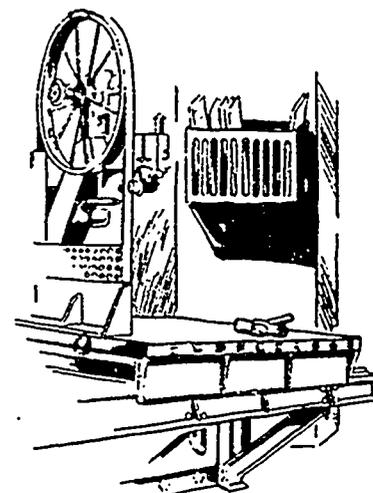


FIGURE III.

ORDER NO. 155	SHOP ORDER NO. 4	WILLIAMS NO. 19
DATE Aug 20, 07	NAME John Jennings	CHECK NO. 65
OPERATIONS		
SANDING		
DOWELING X		
MAKING		
PUTTING ON RIMS		
MOLDING		
CARPING		
BARS		
COMPLETING		
NO. PIECES 700		
KIND 1/2" Oak		
WEIGHTS		
NO. MACH. 312		
RATE 15		
TOTAL COST 11.0		
COST PER .0155		

FIGURE II.

charge of the work should also include the date of the completion of the order.

If the order is one necessitating its transfer from one department to another on trucks, then each truck should bear a job ticket or tag on which should be entered the order number and the name of the article to be manufactured. The tickets should in all cases accompany the order, the number of which could at all times

of time worked, and the exact cost of labor can thus be obtained.

It is a very simple matter to determine the cost of non-productive labor by computing the cost of the productive labor for a given period in a given department, and dividing the amount thus obtained into the cost of non-productive labor for the same length of time in the same department. To illustrate: Assuming that the productive labor amounted to \$1,000 for a

umn. The amount of scrap and waste therefore can easily be determined by a comparison of the foreman's report and the office estimate.

In determining the percentage of waste add the various amounts of stock estimated for the different orders and also the amount of stock cut, and the difference will give the amount of scrap and waste together. The superintendent should estimate the amount of stock in the scrap bin. The difference between the stock there and the total amount of scrap and waste divided by the amount of stock cut will give the proportion of waste.

Several entries on the card (Figure IV) serve to properly illustrate this. It will be seen that the entries show that on the orders No. 250, No. 251 and No. 252 the office estimate amounted in the aggregate to 3223 feet. The actual amount of material cut was 4353 feet. The superintendent finds the amount of scrap to be 354 feet. The difference between the amount actually cut and the office estimate is 1028 feet, deducting the 345 feet of scrap leaves a difference of 683 feet, which is properly waste.

The above operation results in determining the cost of material and the 15 per cent. thus obtained is added to the estimate to cover the

* Reproduced by permission from "System," of Muskegon, Mich.

cost of waste, and this will give you approximately an accurate cost of material.

ASSEMBLY CARDS.

It is next necessary to ascertain the cost of the completed article. To do this an assembly card (Figure V) is suggested. The cost of the different operations by department, as will be seen, is entered in the proper column, the operator's name or number and the depart-

KIND OF LUMBER		RECEIVED		SENT		DATE		ORDER NO.		AMOUNT		CUT		AMERICAN		WASTE		BALANCE		
7	White Oak	27000	2	25	555	1200	1250													
7		5200																		
		1500																		
8	Burrings	7700																		

FIGURE IV.

ment, the number of hours employed and the total. Material can also be figured with the value and the cost per piece for material, cost per piece for labor, the shop burden or loss, or according to the name of the article. The cards may be filed in one of three ways, either alphabetically according to the name of the party for whom the order was constructed, numerically according to the order number, or according to the name of the article. The forms can easily be enlarged or contracted to meet the particular requirements of factories of any capacity, and it will apply to any line in the manufacturing world.

HANDLING STOCK IN THE PLANING MILL.

As soon as a piece of lumber is dressed it must go somewhere at once, for the tale man at a machine that is doing anything like a day's work has no time to dally with it very long. If the system is a chain that carries all stock past a grading platform where one grader does all the work, that part of the matter is easily disposed of, and the final disposition is a matter of so much or so little trucking.

In some mills that have a number of machines conveniently in line, it is found to be most profitable to have a chain transfer at the feeding-out end of the machines and traveling at right angles to the delivery of the lumber. This chain, says a writer in The Wood-Worker, takes the finished product past a given point, where it is graded and marked for the stock shed, to which point it is conveyed by trucks, commonly called "dollies," or by a roller or chain transfer to a certain point in the stock shed, where the stock is loaded on trucks of varying form, for final distribution to the cars or to the stock bins to which it may have been assigned.

For the transfer system and the single grader there is this advantage, that there is not at all times the difficulty of finding a number of graders at higher wages than are paid to the laborers, and it also has a tendency to make

the grades more uniform. There is also this advantage, all the trimming is done at the one saw at the grader's stand, and it is done right under his eye, so that the tendency to waste can be checked.

The final disposition of the dressed stock has to be made on the trucks, as no system yet devised has been able to handle so great a variety of sizes and grades and do it without the help of trucks of some sort. The shape and construction of these trucks vary in almost every locality, many mills yet using the old two-wheel "dolie," with all its unhandy features. There are many of them in the pine mills of the south, for no other reason, in some cases, than that they are considered "nigger" proof.

From an extensive experience I prefer the factory truck with removable standards to any other, for ease of handling and low first cost. A number of them can be placed convenient to the grader and all the bundled stock put on a truck, with each grade separate, while a fair-size boy can roll 500 feet on a level floor. Then there is this other advantage that the stock is never allowed to touch the floor, an advantage that contributes no small share toward lessening the cost of handling. These trucks can be handled in as small a space and around as sharp a corner as the "dolie," and have the added advantage that they will not upset nor tip up on the end when loaded, as the higher "dollies" are so prone to do. Where the lumber is bundled for shipment, these trucks are even more of a convenience, as the bundles can be loaded higher on a given platform space on the frame without sticking and are in no danger of being shaken off in the rolling of the truck. Once used they are seldom discarded.

In the case where there is a grader at the several machines (and that system is by no means discarded) these little adjuncts to the success of a mill are especially valuable, as they furnish a ready means of transporting assorted quantities of lumber in a more compact and cleaner shape than by any other means. In case of necessity these trucks offer a sort of portable warehouse, holding their contents securely, yet ready for a quick movement, and taking very little room.

I have watched a number of systems of the transfer sort, and except for the saving effected at the grading end, there is not much to commend them over the trucks, and the trucks have to form no inconsiderable part of most transfer systems. In a number of instances I have seen lumber graded in the rough and loaded on the cars from the machine, without further grading, except in the case of a board getting accidentally spoiled and laid aside. That does not seem to me to be a good system for anything else than plain surfacing or resawing where the lumber is shipped pile run and there

are no culls to be laid out. For machines that work on stock from which orders are to be selected as they come in, this will not answer. It is in a case of this sort that the little trucks show their value.

FORESTRY METHODS.

The last report of the New York State College of Forestry contains some pertinent remarks by Dr. B. E. Fernow, the Director, in respect to the planting of hardwoods in the Adirondacks. He says:

There is one fact on the silvicultural side which the experiment has demonstrated to the satisfaction of the writer, namely, that in the hardwood forest of the Adirondacks, where the pine and spruce have been severely culled, the only practicable method, both from financial and silvicultural points of view, of securing a desirable new crop, is a clear cutting system, followed by artificial regeneration of the conifers, leaving only enough of the hardwoods to produce an admixture by natural regeneration, and saving only so much of the promising volunteer growth of young hardwoods and conifers as is not liable to be thrown by the winds. Indeed, it may often be best to make a clean sweep—denude, though the word has been used to denote vandalism—and replace artificially without reference to existing volunteer growth. This planting, of course, costs; it is an investment for the future, but one that can be easily shown to be profitable in the long run. This method cannot be practised without taking care of the rubbish resulting from the logging operation, and this, of course, again entails expense. But when the simple and efficient system of clearing, followed by planting, is practised, the debris can be buried more cheaply, using the early spring season, before the snow is quite gone, and thus the fire danger, always attending logging operations, can be most readily reduced. The forest management has, indeed, by close watching, so far been fortunate in avoiding this con-

NO. PIECES		NAME OF ARTICLE		SHOP ORDER NO.		
700		#118 R.		521		
DATE ORDERED		DATE BEGUN		DATE FINISHED		
Oct 1904		Oct 11		Oct 15		
DEPARTMENT	OPERATIONS	HOURS	RATE	AMOUNT	MATERIAL	AMOUNT
Unskilled	Swing	10	12	120	12000 2x12x6	750
	Shaping	12	12	144	Roller	270
	Grading	18	1	180	Planer	630
Skilled	Rolling	14.5	70	1015	Chute	210
	Rolling	17	25	425		
	Resawing	17	25	425		
	Rolling	16.5	20	330		
				TOTAL COST MATERIAL	1185	
				SHOP BURDEN	720	
				COST PER PIECE MATERIAL	1.69	
				LABOR	1.50	
TOTAL LABOR COST ON 700 Pcs				1.19	TOTAL COST PER PCE:	2.89

FIGURE V.

stantly threatening danger. Here, too, the management needs financial assistance to increase means of prevention of forest fires, at least of the young plantations which are to replace the old crop. The annual logging area comprises between 500 and 800 acres, of which probably at least one-half will require replanting, and on these areas special precautions to ward off fire are necessary.

HOOKS IN BAND SAWS.

The more hook the greater the cutting ability of the band saw and the less motive power is required. Too much hook could not be given a saw if the question of cutting is alone considered. What makes the excessive hook detrimental or hazardous to the safety of the machine is the tendency for teeth with extreme hook to feed too rapidly. More hook can be given to the circular than to the band, as the circular, being round, has a tendency to throw or push the stock from it somewhat, irrespective of the hook. But the band saw, acting at right angles, has more of a tendency toward it. In the case of a band saw with no hook, the action of the teeth would not be so much one of cutting as of scraping or splitting.

Hardwoods require less hook than soft woods, and of the soft woods those that are stringy or fibrous require the most hook. Some of the most successful saw filers make no distinction in hook in cutting hard or soft woods, but run the same tooth with apparently equal success. In general practice, however, the hook used on saws for hardwood is from one-fourth to one-third and in rare cases one-half.

As regards the efficiency of the saw in different woods, a good deal depends upon having the saw fitted with proper swage and side-dress, kept properly sharp, properly slim and throated, and the feed not too fast. Very thin band saws are run successfully in re-sawing the hardest wood, such as kiln-dried oak, etc., but the teeth must be finely fitted, and the stock properly fed.

The action of saw teeth is identical with that of a chisel, and just as a woodworker learns to present his chisel at the right angle to the wood, to cut the best, so must the saw fitter learn at what angle his saw teeth are best calculated to cut, as regards hook. There should be no such thing as scraping or tearing, through imperfect hook or dullness. A dull saw takes much more power than a sharp saw, because its operation is not clean-cutting.

There is a general tendency on the part of

band saw filers to run more hook in their saws. This may be done without impairing the strength of the tooth to the extent that it will chatter or vibrate in the cut by allowing the hook to run down the face of the tooth about a quarter of an inch, and then drop away from the hook line on a gradual curve, forming a nice, round throat, which enables a saw to cut easily on big feed.

The back of tooth must be made sufficiently full or rounding to give plenty of strength to point of tooth and you must avoid long teeth on short spacings. For a tooth with extreme hook, and for a large round gullet, a spacing of 1 3/4 or 2 inches is right. This long space enables you to build up the back of tooth properly, because, with the greater space between the points, the backs can be kept higher without diminishing the throat room, and thus more hook is secured without weakening the teeth.

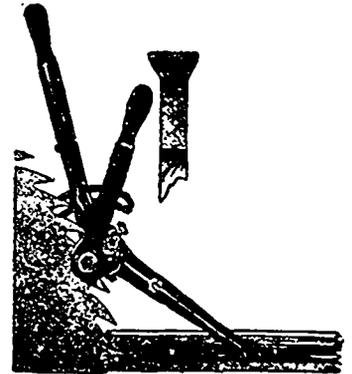
The amount of hook in wide band saws varies from 4 to 6 1/2 inches in a 10-inch saw as commonly run, and is governed somewhat by the timber being sawed and the feed carried. But there are those who want still more hook than that mentioned above, and their efforts in this direction have been thwarted in a measure because the construction of sharpeners has rendered it impossible to further tilt the head for extra hook, and still have the machine continue to operate successfully.

In deference to this circumstance, some machines now give a possible hook of 12 inches, in 12 inches of width or 45 degrees. Moreover, the construction of the machines renders their operation equally successful when head is thus set as when set at a less extreme tilt. Given a saw properly tensioned and running true on the wheels when out of the cut, or running idle, but tending to run back on the wheels, as soon as it enters the log, it indicates a need of more hook, and you can increase the hook up to the point where the saw runs uniform. In like manner, if saws run ahead of the wheels when in the cut, it is an indication of too much hook, and you may properly consider the reduction of same.—Packages.

A SUPERIOR FILING ROOM MACHINE.

Sawfiling might truly be called a science, and the filer an artist, so keen a similarity must there be between each tooth. And each tooth must be so accurately and scientifically drawn out that not one tooth will bind in the log. The teeth must be swaged so as to give a sharp cutting edge widest at extreme points. All this could be done to a certain extent by the old method with hammer and bar. But American ambition and push demanded quicker and more accurate filing-room practices, until now every first-class saw mill or factory has an up-to-date filing room fitted with the most expensive and best machines that are on the market.

One of the first machines the filers began to demand was a good practical saw swage; but only of late years has a thoroughly practical swage been put upon the market. Of these the Hanchett swage, manufactured by the Hanchett Swage Works, Big Rapids, Michigan,



THE HANCHETT SWAGE.

has perhaps the best claim to superiority. This is not only shown by a number of other swages having been modeled after it, but it has also several distinct features that are not duplicated by any other swage in existence.

1st. Take for example a saw that has struck a nail or other obstruction, and the corners are entirely gone on one side, or the teeth are broken off, say, 1-16 of an inch. By pulling the swaging lever over a second time a fine swage may be obtained and the teeth will be drawn out as long as the others, while other swages will bend a short tooth backward and not swage it at all.

2nd. Take a saw that has just been ground down and no swage is started. By pulling the swaging lever over a second time on say a 14 gauge, a seven or better can be obtained, and the saw will grind up even the first time grinding. With other swages an upset must be used first, which results in long and short teeth, besides more or less of them will be bent.

Pennsylvania Lumbermen's Mutual Fire Insurance Co.

Philadelphia, Pa. February 24th 1903.

Pay to the order of *Gillies Bros Ltd*

for Dividend on Policies No. 157, 158, 159

Twenty seven and 100 Dollars

The First State Fidelity Insurance and Trust Company

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Pennsylvania Lumbermen's Mutual Fire Insurance Co.
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Dividend Check

No. 188

THIS IS THE WAY WE SAVE MONEY FOR LUMBERMEN. THERE ARE OTHERS—WRITE US

LUCAS, STEELE & BRISTOL,

HAMILTON, ONT.

Wholesale Grocers and Importers

LUMBERMEN'S SUPPLIES A SPECIALTY

A NOTABLE SAWING EVENT.

The following notice, clipped from the Southland Daily News, published at Invercargill, New Zealand, is an interesting account of some sawing contests in which the world-famous Atkins saws played an important part. As usual the prize winners of the Championship Contests used Atkins saws, thus again demonstrating the fact that "Atkins is Always Ahead."

"The Axemen's Carnival, which was held at Invercargill, New Zealand, on April 13th, 1903, was a notable event, there being sawing and chopping contests, bicycle and foot races, as well as other athletic sports indulged in.

"The gathering of the axemen and sawyers was perhaps as fine as has been seen anywhere, comprising the leading men in both lines, from Australia, Tasmania, and the provinces of New Zealand. Intense interest centered in Thomas Pettit, the world's champion, who competed with great success in the sawing events, annexing the champion single-handed, and with H. Mitchell, the champion double. He saws with beautiful action and immense force, and the Atkins saw used by him simply ploughed its way through the blocks. Considering that Pettit has had very little training for the matches, his performance must stamp him as undoubtedly the foremost man of the first rank of sawyers.

"Another distinguished competitor was Herb Mitchell, ex-champion of New Zealand, who is well and popular known all over the island.

"For the championship single-handed sawing contest,

E. C. Atkins & Company, the well known saw manufacturers of Indianapolis, Indiana, U. S. A., through their Australian representative, Mr. C. Cullen, donated \$50. The first prize of \$25, and championship gold medal, was won by Thomas Pettit; S. Fisher took second prize, \$15; and Edward Tobin third prize, \$10. Both Pettit and Fisher used Atkins saws. Pettit's time was one minute-48-2/5 seconds.

In the double-handed sawing contest, Thomas Pettit and H. Mitchell won the first prize of \$25, two gold medals and two saws. It was a splendid exhibition of the sawyer's art. Pettit and his mate got to work with a wonderful swing of rapidity and ease, and sent their Atkins saw through the 24" red pine log in the surprising time of 32 3/5 seconds."

BELTING FOR LUMBERMEN.

The Dominion Belting Company, Limited, of Hamilton, Canada, are the latest in the field with belting especially adapted to the use of mills. It is a stitched oiled cotton duck belting, the steadily increasing demand for which has encouraged the company to erect a most up-to-date factory at Hamilton for its manufacture.

Their plant is now in operation, with a capacity of turning out six thousand feet of belting daily. The guarantee of the company is that their belting will give entire satisfaction, and that it is unaffected by air, atmosphere, steam, heat or acid fumes.

This belting is constructed from raw material wholly of Canadian production, and the company claim to be thus enabled to make prices much below the cost of importation.

It is their intention to use nothing but the very best duck made especially from their own formula, and this duck will be treated with a special preparation known only to their superintendent and perfected by him after an experience of 20 years in the business.

By the use of this duck and process, they promise to supply a belt equal to anything yet placed on the market as regards tensile strength, pliability, weight and freedom from stretching.

The president of this new Canadian company is Mr. John J. McGill, a gentleman well and favorably known in the highest financial and business circles.

Advertising, like the water that runs the mill, must be kept constantly flowing.—White's Sayings.

P. PAYETTE & CO.

Manufacturers of Saw Mill and Engine Machinery, and all kinds of Marine Machinery.
PENTANQUISHIENE, ONT

The Lumberman's Diet

Clark's corned Beef and Clark's Pork and Beans are the best produced in Canada and equal to the finest imported. Get quotations from your jobber.

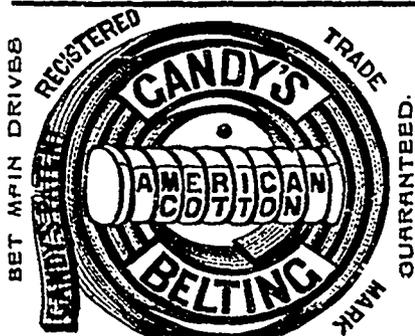
W. CLARK, Manufacturer, MONTREAL

NO UNPAID LOSSES

Hundreds of Well Pleased
Policy-Holders. 3/4 3/4 3/4

LUMBER UNDERWRITERS

66 Broadway, New York.



Sole Canadian Agents :: Prices Reduced
WATEROUS BRANTFORD, CANADA.

WE MAKE A SPECIALTY OF SMALL STEAM POWERS

For every kind of service - MILL, AGRICULTURAL and MARINE.

These engines are reliable and easily managed. Remarkably small and compact for the power developed. Light and portable. They will reverse instantly at any point. High-speed, noiseless, and non-vibrative. And they are above all economical engines.

We also devote ourselves to Small Steam Yacht Installations, using Fuel-Oil and Quick-Steaming Boilers, as well as to Direct Connected Lighting Units.

The **SLEEPER ENGINE COMPANY, Limited, Montreal.**
Phono. East 2403. Office and Works, Cor. Darling and Notre Dame Streets

BALANCING PLANER KNIVES.

When the heads of a wood planer of any kind that is intended to plane or surface wide boards are made, they are balanced so as to prevent vibration at high speeds, and the knives are the same size and weight, so that when a head is set up it runs smoothly. When the knives become dull they are taken out, put on a wet emery grinder and made sharp again; but more material must be removed from some than others, therefore when put back the head is out of balance.

In order to remedy this evil the knives are taken off and weighed, after which the heavier one is taken to the drill press, or to a lathe if no drill press is available, and holes bored in it until it will balance the other when put on a pair of scales or balances.

These knives may be twenty-four inches long, and when started up again may produce inferior lumber, because it is not planed smoothly. This shows mainly that the head is not perfectly balanced, although the knives are of usual weight, causing an inexperienced operator to wonder what causes the trouble. Now, if these knives were cut in two and the halves of each pair weighed and compared, it would be plain that both ends of the head were out of balance, when considered separately, hence the trouble.

Of course it is not practical to cut these knives in two, but they may be made perfect by balancing each separately, although that may seem to be an inconsistent statement. It may be explained as follows: Suppose that a piece of iron one-eighth inch thick is put in a vise and one of these knives balanced across the edge of it, taking care to support it at the exact centre. One end of it will be heavier than the other, therefore it becomes necessary to remove some of the material until both ends weigh the same. This knife is then balanced by itself, and when the other one of the pair is balanced in the same way we know that no more trouble will result from that source; but the two knives must now be put on the balances again and made to weigh alike, as already described.

It is necessary, however, during this process to remove an equal amount of material from both ends of the heavy knife, in order to maintain the individual balance. We are well aware of the fact that it is difficult to follow the above directions for this process, because giving the knives individual balance disturbs the collective balance, and vice versa. We do not claim that this precision in balancing is necessary in all cases, for it is not, but where imperfect lumber is produced, lack of it may be, and frequently is, the cause of it.

This applies to long knives only, because short ones are not affected by it enough to be noticeable. When knives of this kind are new they are usually the same weight throughout their length and they may be kept so by careful attention to the grinding process, for if the individual or separate balance is correct, but the pair do not agree, the heavy one may be put back in the grinder and another cut taken off from it over its entire length. It is not easy to strike it just right in this way, but a little practice will enable the operator to do good work along this line. If for any reason it is desirable to continue the practice of boring holes, care

should be taken to bore the same on both ends of the knife. Of course these holes should not extend entirely through the blade, as that would weaken it unduly, but by using a flat drill ground to an obtuse angle, or, in other words, one that is made blunt, the holes will be large, thus removing a considerable material without going entirely through.—The Tradesman.

THIN CIRCULARS FOR LOG SAWING.*

By J. H. MINER, Lumberton, Miss.

Much attention is now being paid to thinner saws by practical millmen. Economy more fully asserts itself each year and millmen are beginning to draw the line more closely. Before the band saw was fully introduced it was condemned by ninety-nine out of a hundred. But thin bands or thin circulars are no longer an experiment and some fast circular mills have used nothing heavier than 10 gauge for years. True, they have been tried by many without success, but the fault was not in the saw.

The day is coming when 12 gauge saws will cut 50,000 feet per day. I received a letter recently from a prominent filer in Arkansas stating that he had cut 78 lines, 16 feet long, 12 inches deep of good lumber with a 10 gauge saw in 5 minutes. But under the same treatment that 90 per cent. of the thick saws get, not one could expect a thin saw to be a success even on a smaller output. The fact is that there are but few men who get out of the circular all that there is in it. If one man can run 72 inch by 12 gauge saws successfully, that demonstrates that it can be done. If others can't do it there must be something lacking. There are several essentials. To be a success, thin saws must be run at a high speed, must have an absolutely solid, steady running mandrel, plenty of power, and a good filer and sawyer. A thin saw is more sensitive than a thick one, and under like circumstances the thin saw cannot be expected to do as much work.

Suppose that the millman who is satisfied with 50,000 feet from his 6 or 7 gauge saws, run at a standard speed, would put in a 10 gauge 60 inch saw with 100 teeth and speed this saw to 1,000 revolutions, and could get a practical sawyer and filer that could and would run it, he would, to his surprise, increase his cut with a considerable saving in saw kerf. If the man that contemplates a new mill, and wants 50,000 to 75,000 feet per day, would put in 72 inch by 12 gauge saws, with not less than 110 teeth, with speed 1,100 and a 12 inch cylinder feed, to my mind he would have the most economical mill that could be built. There are many who are ready to assert that this is too high a speed and that the steel will not stand this strain. This is a mistake, for saws have been run successfully at this speed. The greatest drawback in introducing thin saws is to get filers who can fit them properly. The filer and sawyer must work in unison. All prejudice and personal feeling must be laid aside, both working solely to the employer's interest, instead of one or the other seeking to work to the other's disadvantage, which is sometimes done in a manner so intricate that the most

*The author is an authority on circular saw hammering and fitting.

practical foreman cannot detect where the trouble is.

In running thin circulars the tension must be absolutely uniform and in exactly the proper place. There is a vast diversity of opinion about where the exact location of the tension should be, but practical filers do not disagree on this point. A variation of 1-1000 of an inch in the drop of any high speed saw will take 2 inches feed from it; that is, adjust that 1-1000 of an inch and the saw will stand 2 inches more feed.

A high speed saw can be accurately hammered only by the use of a gauge properly curved, and the saw must be hammered until it shows no light under the gauge. It will then be practically all uniform, and so far as tension goes, in perfect condition to run.

The utmost care must be exercised in the temper of high-speed thin saws. If it is not uniform then the saw will be thrown out of tension at its speed, no matter how perfectly balanced. It will astonish any practical man that uses the straight edge how much he can improve either bands, circulars or band resaws with a tension gauge of the proper curve. I could not get a saw at high-speed anywhere near uniform without one. There is no estimating what a high-speed, perfectly hammered saw will do on a quick rig with a good sawyer. At the same speed the thick saw would certainly do more work than the thin. I refer to mills maintaining their present output with thin saws. No one wants to decrease his cut, for what would be gained in one way would be lost in another. I am just in receipt of a letter from a saw company wanting to send a 9 or 10 gauge 60-inch saw here on trial. We are now using 8-gauge, 56-inch, 96 teeth, and don't think we can hold the cut at 100,000 feet per day with thinner saws. If I could increase our speed from 925 to 1,100, I would try the thinner saws.

This is an item in every up-to-date mill where trimmers and gang slashers are used. The public have had much to read in the trade papers about broken cut-off saws, but I find that the secret is in but one thing principally, and that is in giving them more set. They should be filled or ground square in front, with pitch line to centre, with the back beveled. This makes beyond a doubt the best tooth for a cut-off saw, swing or stationary. Each tooth is a cutter and a raker. If the reader doubts this, just fit up one saw and that will convince him. Large cut-off saws should be left a little slack on the rim, sufficient not to wave while in motion. Cut-off saws should be at least one gauge heavier than the standard. This will add no more in price or in power to run, but will add 50 per cent. to the life of the saw. I have never seen a cut-off saw that was not abused; getting pinched or twisted. Keep them sharp, file square in front and with plenty of set, and that will reduce the broken saw expense to a minimum. It is supposed that the reader is aware that square corners will cause cracks. The same applies to all machinery where subject to strain. Short cracks can be deeply center punched on each side which will arrest it. Cracks over three inches long should be drilled. Solid blows must be applied or the crack might extend further while punching.

FEEDING WORK HORSES.

The horse has a smaller stomach than an ox, and consequently must be fed less at a time. It has less power to digest coarse foods. It eats much slower, as it must do all its chewing before the food is swallowed. For these reasons it requires a longer time to eat, and its food should be more concentrated. It wants only a little coarse food at a time. Most people feed too much rather than too little, especially of hay. According to the tables of standard ration prepared by the German investigators, a 1,000 pound horse requires 11.4 pounds of digestible food daily when doing moderate work, 13.6 pounds for average work, and 16.6 pounds for heavy work. With a basal ration of 10 pounds of hay, the grain needed to furnish the above quantities of digestible nutriment, when consisting of a mixture in equal parts of corn and oats, would be approximately 11.5 pounds, 15 pounds and 20 pounds for three sorts of labor. Lavalard, who made observations covering a number of years with 32,000 omnibus, army, and draft horses, came to the conclusion that a horse performing ordinary work requires at the rate of 1,215 pounds of digestible nutriment per 100 pounds of live weight. This is equivalent to 12.1 pounds of digestible food daily for a 1,000 pound horse, a quantity not inconsistent with the German standard.

SUITABLE FOODS FOR HORSES.

It is necessary, especially with hard working horses, that a large proportion of the daily ration be composed of the more concentrated feeding stuffs. A horse would have to consume over 40 pounds of hay to obtain 17.7 pounds of digestible nutriment, the approximate amount required daily by a horse at severe labor. Ten to twelve pounds of hay daily is quite sufficient for a draft horse. The managers of work horses on many farms are kept constantly supplied with hay, which is not only wasteful, but injurious to the animal as well. Recent researches have shown that muscular effort is largely sustained by the carbo-hydrates and fats of the food, and it is probably true that rations composed of the ordinary farm products, meadow hay, straw, silage, roots and the cereal grains will be found sufficiently rich in protein without the addition of nitrogenous feeding stuffs. Doubtless in cases of heavy labor, the addition of a little oil meal or other nitrogenous food would be beneficial. According to the German standards the nutritive ratio should be from 1.7 to 1.6 according to the severity of labor, the daily weight of protein to be from 1.5 to 2.5 pounds. Oats are regarded by many as essential to the maintenance of the driving or working horse, but many other foods are successfully used in their place, wheat, bran, corn, barley, dried brewers' grains, etc., are often used instead of oats without any bad results, and frequently with considerable advantage in the cost of the ration. Timothy hay, although not particularly rich in digestible nutrients, is preferred by most horsemen, chiefly on account of the freedom from dust and the ease with which it may be distinguished from other grasses. With working horses, whose sustenance is largely supplied by the grain food, timothy is probably the most

satisfactory roughage, but bright, clean clover is excellent for idle horses and colts, and requires very little grain in addition to form a suitable ration.

SOME SAMPLE RATIONS.

Some good rations for 1,000 pound horses at moderate work are suggested by Jordan:—

1. 10 lbs. timothy or mixed hay, 11½ lbs. oats.
2. 10 lbs. hay, 10½ lbs. oats and barley, equal parts by weight.
3. 10 lbs. hay, 8 lbs. oats, 4 lbs. brewers' grains.
4. 10 lbs. hay, 8 lbs. oats, 4 lbs. wheat bran.
5. 11 lbs. hay, 3½ lbs. corn, 4 lbs. wheat bran, 4 lbs. brewers' grains.
6. 10 lbs. hay, 5 lbs. corn, 4½ lbs. barley.
7. 10 lbs. hay, 5 lbs. corn, 6½ lbs. wheat bran.
8. 10 lbs. hay, 5 lbs. corn, 6 lbs. brewers' grains.
9. 10 lbs. hay, 4½ lbs. barley, 4 lbs. wheat bran, 3 lbs. brewers' grains.

Silage, roots and other green food may often be substituted for a minor part of the hay with advantage to the animals' appetite and health.

Where the work is harder the amount of grain in the ration should be increased; but the amount of hay should remain stationary. The increase in feed should be greater proportionately than the increase in the amount of work done, and as a general rule old horses should be fed better than young ones. That judgment which comes of experience will always be a safer guide than any mechanical rule for feeding, but this is certain, however, whatever feeding stuffs are used, and whatever order of feeding is adopted, regularity and uniformity should at all times prevail in both feeding and watering. If water is always available, a horse will not take too much to injure himself, but with working horses it will always be found better to give them their regular and largest supply previous to feeding, and it may also be well to supply a limited supply after feeding. When much heated or fatigued a horse should have water only in small quantities.

The Arabs have a proverb:—"Rest and fat are the greatest enemies of the horse." Hard labor or an abundance of exercise should go hand in hand with heavy feeding, and when a period of idleness comes for the horse the grain ration should be cut down one half at least, or even withdrawn altogether where the fodder is particularly good quality.

Some years ago the W. C. Edwards Company, of Rockland, O. A., adopted a system of feeding their horses which has proved very satisfactory. Mr. Edwards gives the following description of it: "We employ say forty horses about our mills here in the summer season. In the rear of our stables we have a feed room, where cut straw for bedding and our cut hay, oats and ground feed are kept; here we have two mixing boxes, where the rations for the horses are mixed before feeding; the cut hay is put into these boxes and is thoroughly soaked with water 12 hours before it is fed. The ground feed is mixed dry and before feeding is thoroughly mixed with the wet hay. The rations we started out with was 4 lbs. cut hay,

½ lb. bran and 5 lbs. ground oats and arley to each horse night and morning, and 4 lbs. dry oats at noon only. Our horses are generally of large size, and are doing excessively hard work, and we found this ration too small for them and gradually increased it until we settled down to this:—5 lbs. hay, 5 lbs. ground grain, and ½ lb. of bran to each horse morning and night, and 8 lbs. of dry oats at noon only (no hay), and this we find ample for the largest horse doing the most excessive work. Our saving is at least 10 lbs. of hay per day for each horse, and 6 lbs. of grain for each. Not only is this the case, but our horses are healthier and better in every way. Under the old system it was a common thing for us to lose from one to five horses every summer with colic and inflammation, but in the past seven summers under our new system not only have we not lost one horse, but we have not had a sick horse. A much smaller ration than we feed would be ample for farm horses, or for any horses doing ordinary work. We may add, also, that with this system of feeding hay, together with the free use of wheat, bran and a little ground oats mixed with it, we find we can develop colts in a manner that we have never seen them developed before."

F. W. HODSON,
Live Stock Commissioner.

THE BURRARD INLET FLUME & BOOM COMPANY, LIMITED.

This company owns a large amount of cedar timber in the Capilano Valley of British Columbia, commencing at the Vancouver city water works dam (which is 7 miles from tide water on Vancouver Harbor) and extending up Capilano river about 4 or 5 miles.

The timber will be brought down to salt water on Burrard Inlet (Vancouver Harbor) by building a flume about 4½ miles long, and utilizing the river for the balance of the distance.

The company has a water record from the Provincial Government for diverting the necessary water from the Capilano river for operation of the flume, and under the Rivers and Streams Act they have been given control of the Capilano river, whereby they may clean out and improve the river, build the necessary retaining booms at its mouth and be allowed to charge a toll to other parties who may wish to use the river—toll to be fixed by a judge of the court.

The company has also permission from the Dominion Government to use a portion of the Indian Reservation at the mouth of the Capilano river to make the necessary shore fastenings for their booms, as well as for other purposes in connection with their business. The flume is being built principally for carrying shingle bolts, but will be large enough and straight enough to carry long bolts—12 to 18 feet long. It will be constructed V shape, 24 inches deep and made of 2-inch plank.

The officials of the company are: J. G. Woods, President and Managing Director; H. H. Spicer, Secretary; H. M. Burwell, S. O. Richards, R. Byron Johnson, Hon. Cecil Edwards, all of Vancouver.

Quance Bros., of Delhi, Ont., are extending their planing mill and adding a new engine and boiler.

SOME FACTS ABOUT CHECKS.

Bank checks possess many advantages for the conduct of business, and are used to a proportionately great extent. They are in nature but orders for the payment of money, and are payable in the order in which they are presented, not according to that in which they are drawn, says C. E. Locke in an exchange. As given in the usual course of business, they do not constitute payment of the indebtedness for which they are given until paid. Nor will the concurrent receipting of the debts for which they are given change this. If they are not paid on proper presentation, resort may be had to the original claims. The rule is different in this respect as to certified checks. The having of checks certified constitutes payment as to the persons drawing them.

Checks should be dated. If not dated at all, and they do not contain any statement as to when they are to be paid, they are never payable. They may be ante or post-dated, as well as dated on the day of delivery. By being ante-dated they may be made to cover prior transactions, and in a measure determine the relative rights of the parties to them, provided that no fraud is intended or done. Post-dating in the main determines the date of payment.

When post-dated so as to fall due on Sunday, they are payable on the following Monday. Checks post-dated or maturing on legal holidays should be presented the day following. When post-dated checks are paid before the dates mentioned, the money paid on them can be recovered. If blanks are left for the date, the holder of checks are thereby authorized to insert the true dates of delivery, but no other dates, and if they insert any other date it makes the checks void. Changing the date of checks without consent of the drawers will do the same.

The presumption is that when checks are drawn, funds will be provided at the bank on which they are drawn to meet them, but presentation for payment must be made within a reasonable time. If not so presented, the holders will be charged with any consequent loss. When persons receiving checks and the banks on which they drawn are in the same place, they should be presented the same day, or, at the latest, the day after they are received. Where they are in different places, the checks must be mailed to some bank or person at the place where payable before the close of the day following any receipt, and the latter must present them before the close of the banking hours on the day following the receipt there; no extra time will be gained by holders depositing checks in their own banks for collection.

After duly presenting checks, it is also the duty of the holder, if they are not paid, to notify the drawers before the close of the next secular day following the presentation and dishonor. No particular form of notice is required. It may be written or verbal. The principal case in which losses occur from failure to use due diligence in the collection of checks is where the banks on which they are drawn fail in the meantime. If the banks continue solvent, the drawers will remain liable to pay their checks for months at least after they are drawn. Presentation and notice of dishonor will also be dispensed with where there are no

funds to pay checks, and where the banks on which they are drawn suspend payment before they can be presented, using proper diligence. After receiving checks, they must be presented for payment, unless such presentation would be useless before the original claims can be sued on, for, by accepting checks, there is an implied agreement to use that method of procuring the money for which they are drawn.

When checks are negotiable and pass by indorsement or delivery, the same degree of diligence will be required of each person to whom they are indorsed, in order to hold those indorsing them, as is required of original payees to hold original drawers of checks. But by putting checks in circulation, the liability of the drawers cannot be prolonged. They must be presented within the same time by indorsees as by payees.

THIN HEADING SAWS.

A word as to my experience in running thin saws. The saws furnished with our machine were 15-gauge at rim, 38-inch saws, but we still could not endure the waste of kerf. Then an 18-gauge was tried and was found to work well. So the 18-gauge was ordered to be ground 18-gauge at a distance of 3 inches from the edge. The maker misunderstood the order and tapered it from 18 to 21. This saw worked well in soft wood at $\frac{1}{4}$ -inch feed, cutting about 40 to 43 pieces of 18-inch stock to the minute. It had 136 teeth. Had it contained about 200, I believe it would have sawed hardwood. A 22-inch collar was used. This collar caused much trouble; would usually split the wood; in nearly every piece about 10 inches would be checked or broken through. Then a saw was ordered 40 inches in diameter; 24 inches of the center, or a radius of 12 inches, was 6-gauge, then tapered to 17 $\frac{1}{2}$ -gauge to a distance of 1 $\frac{1}{2}$ inches; 17 $\frac{1}{2}$ gauge with 150 teeth. This saw has worked satisfactorily in all kinds of timber and winter weather, pin oak, second-growth, white oak, etc., and is cutting at an average of 46 pieces a minute in a 10-block machine. A very thin saw can be used, providing it is made right, and the more teeth the more feed can be cut. Some manufacturers do not give shingle or heading saws enough tension. A saw that is used with heavy feed must have all the tension that can be given it, and kept tuned up frequently. Our saw is fitted to a 15-inch collar. — Correspondence Cooper's Journal.

HOO-HOO HOUSE AT ST. LOUIS.

There was a meeting in St. Louis, Mo., on June 17th, of the Board of Governors of the House of Hoo-Hoo, which was called for the purpose of reviewing the work thus far done and to outline plans for the future. The report of the secretary showed that about 3,000 members are still needed to complete the membership list, and he was instructed to use all possible haste in completing his part of the work. All reports show that very satisfactory progress has been made in all departments and this indication favors a more complete success to the project than was at first contemplated, as the idea is growing and new methods of in-

creasing the benefits of membership are constantly being added. Applications from many associations of manufacturers have been received for rooms to be finished with their products and nearly all of the rooms in the building are now taken; in fact, such success has crowned the efforts in this direction that the building promises to be a more complete exposition of the commercial woods of the United States than was at first anticipated. The secretary was instructed to try and complete the membership list during the next sixty days, and this is entirely within reason, in view of the number of members applying during the past thirty days. Great progress is being made and it is advisable for those contemplating joining this club to no longer postpone action on the matter, but to join at once.

CHAIN GEARING.

In the opinion of a writer in *Indian Engineering*, chain gearing has several great advantages over belting and ropes. The velocity ratio is absolute, the belt cannot slip; its length is not appreciably altered by moisture or heat, and that very serious increase in pressure on the journals, with all its attendant evils due to the tension it is necessary to maintain on the "slack" side of the belt, is non-existent.

The great objection to chain gearing has hitherto been that great irregularity and noise which is consequent upon engagement with and release from each individual tooth—such objections greatly increasing as the chain wore and stretched—made it impossible to use chain gearing for anything beyond very low velocities.

This, however, is wholly done away with in the Renold silent chain, which is well described by Mr. J. O. Nixon in the "Journal of the Franklin Institute."

The chain essentially consists of a number of links—stamped, it may be, for instance, out of sheet and hinged together at their ends by rivets and built up to any reasonable width, but it is not against the pins or rivets which the teeth of the wheels bear, but against tooth-like projections from the ends of the links. These are so shaped that if the chain were bent round a very small cylinder the concave surface would be a uniform series of parallel triangular teeth; but when straight, the tooth at the following end of one link opens out on the tooth of the preceding end of the next link, with which it before coincided, after the manner of a partly opened pair of shears. Thus the bearing is between the sides of the teeth and not between the bottoms of the spaces between them. The teeth release and engage without sliding friction; all are in contact at once, and as the chain stretches or wears, it simply takes up a position a little further from the axis—working as well and smoothly as at first.

Actually these chains work at very high velocities indeed, in a thoroughly satisfactory manner.

Mr. J. H. Eyer, lumber merchant, of Toronto, has deserted the ranks of bachelorhood, having on June 24th taken as his life partner Miss Simpson, of Toronto Junction. Mr. and Mrs. Eyer sailed on the steamer "Tunisian" from Montreal on June 27th, for a three months' tour of England, Scotland and the Continent.

THE NEWS

—G. T. Browning is about to erect a planing mill at Aurora, Ont.

—A. Mains will establish a sash and door factory at Hartney, Man.

—Hooker & Company, of Selkirk, Man., have sold their business to D. E. Sprague, of Winnipeg.

—The South River Lumber Company have completed extensive improvements to their saw mill at South River, Ont.

—The John Harrison & Sons Company, of Owen Sound, Ont., have just put into operation a new tie mill.

—The Manitoulin Ranch & Lumber Company, Limited, with headquarters at Windsor, Ont., has been incorporated.

—W. S. Eddy, of Bay City, Mich., is reported to have purchased 2,500,000 acres of timber land in Mexico.

—The Canadian Skewer Company, of Hespler, Ont., are said to be considering the question of moving to another point.

—George A. Lurrabee's new saw mill on Salmon Creek, near Vancouver, B.C., will have a daily capacity of 30,000 feet.

—Conway & Johnston, lumber merchants, Crystal City, Man., have dissolved partnership, James Conway continuing the business.

—The company formed by W. H. Higgins, of Vancouver, to operate timber limits, have decided to build a large mill at Toba River, 160 miles up the coast.

—The company formed to build a saw mill at Trout Lake, B. C., will be known as the Pingston Creek Lumber Company. The mill will be operated by water power.

—Rhodes, Curry & Company are installing a complete telephone system throughout their wood-working factory at Amherst, N.S. There will be fifteen instruments.

—The Northern Towing Company has been organized at Vancouver, B.C. It is the intention to purchase a fleet of tugs and to devote considerable attention to the towing of logs.

—Stetson, Cutler & Company's two saw mills at St. John, N.B., resumed operations on June 10th, after having been closed since December. Fred C. Beatty is now superintendent of the mill.

—Incorporation has been granted to the Kettle River Lumber Company, Limited, which recently took over the lumber business of Lequime & Powers at Grand Forks, B. C. The capitalization is \$50,000.

—J. S. Deschamps, L. A. Campbell and Frank R. Mendanhall are said to have formed a partnership to acquire timber limits and build a saw mill on the Columbia river between Trail and Robson, B. C.

—The mill of F. E. Sayre at Briggs Corner, N. B., which was destroyed by a forest fire last month, was a well equipped establishment with a daily capacity of 20,000 feet, in addition to shingle and lath machines.

—Proceedings were taken in Ottawa against J. R. Booth and the W. C. Edwards Company for violation of the recently enacted by-law prohibiting the piling of lumber within the limits of the city. A small fine was imposed.

—The James Murchie & Sons Company has been incorporated under the laws of the State of Maine, with a paid-up capital of \$495,000. The company will conduct a general lumber business. J. G. Murchie, of St. John, is interested.

—The Meductic Meat Company have made a proposition to establish industries at Woodstock, N.B., for the curing of meat and for manufacturing hubs, spokes, ferkins, and barrels. They agree to expend \$20,000 on buildings and plant.

—The new mill which Alfred Dickie and John A. Gillies, of Stewiacke, N.S., are building in Labrador will be equipped with a Killam double circular, a live gang, and a stock gang fitted to cut South American specifications. They recently purchased the steamer Viking for use as a transport to and from Labrador.

—Lumbermen were prominent in the recent military tournament in Madison Square Gardens, New York. One of the regiments was the 42nd of Ottawa, which is known as the "Duke of Cornwall's Own." This regiment is composed largely of bushmen, the officers including Capt. R. Blackburn, of the Hawkesbury Lumber Company, and Capt. Cameron, of Cameron & Company, Ottawa.

—The Grand Valley Seignory, comprising 54 miles of timber limits and a saw mill in the Lake St. John District of Quebec, formerly owned by the Lowell Estate, has been purchased for the sum of \$100,000 by a syndicate of New York and Ontario capitalists. The new owners intend to spend a considerable sum of money in the development of the property and will manufacture lumber for the European market.

—Dennis Harris, C. E., was commissioned by the British Columbia Government to make a survey between the west end of Cowichan Lake and the headwaters of Alberni Inlet. His report contains the following in reference to the timber: "From zero to station 50 (one mile) the timber consists principally of yellow cedar and hemlock. From this on, as far as I went in the valley, on both sides of the river, but below the line, there is a belt of long, straight fir timber, 1,500 feet wide, averaging 18 to 36 inches, which will cut as high as 60 M. to the acre, of good merchantable timber. This belt of fir timber is fringed with a line of sound hemlock of large dimensions."

—A large mill for the manufacture of cooperage stock is being established at Sand Point, Ont., by S. O. Church & Bro., of New York, who have two other mills in Canada and three in the United States. The heading mill at Sand Point was completed last spring, and the stave and hoop mill will be finished at an early date.

The roof of the heading mill is covered with galvanized iron. The power equipment includes an Osborne & Kelly engine of 65 horse power. The dry kiln was furnished by the Standard Dry Kiln Company, of Indianapolis, and uses live steam from the boiler. A siding 1,100 feet in length from the C.P.R. track furnishes shipping facilities. The timber used is elm, ash, basswood, soft maple, butternut, poplar and balsam of gilead, the product being shipped largely to the sugar refineries in Montreal. The manager of the mill is T. H. DeCew, late of Fenelon Falls, who has been engaged in this line of business for many years and is well qualified for the position.

TRADE NOTES.

Attention is directed to the advertisement of the Hart Emery Wheel Company, Limited, of Hamilton, Canada, in this issue. The company is one of the most progressive of our Canadian manufacturing firms.

Rapid progress is being made with the new works of the Owen Sound Iron Company at Owen Sound, Ont. The main building will be 337 feet long. South of the main building will be the boiler shop, 34 x 49 feet, while the box shed facing Water street will be 31 x 72 feet. There will be a pattern storage building 52 x 34 feet and a pattern shop 35 x 26 feet, two-stories high. The company will install its own electric light plant.

The Capstan Manufacturing Company, 30 Jarvis street, Toronto, have secured some very large orders from lumbermen for the supply of the lumber camps with mince-meats, baking powder, spices, extracts, etc., for the next season. This company is doing quite a large business in the supply line and are now filling orders for coffees, mustards, flavoring extracts, sauer kraut and sausage meats. The particular neat and clean manner in which the goods are put up is in marked contrast to the years when "any old thing" was good enough for a lumber camp.

There is no better evidence of the satisfaction which the "A B C" kilns give than the fact that the American Blower Company are continually in receipt of duplicate orders from their customers. We recently noted in our columns that they were furnishing another lot of kilns to the Mengel Box Company, of Louisville. Still another order from these people is now upon the books of the Detroit concern, as well as an order for a duplicate kiln from the Otter Creek (Fla.) Lumber Company, for whom they installed a kiln a short time since. The Walsh Mfg. Company, of Frederic, Mich., and the Tuna Mfg. Company of Bradford, Pa., have also ordered "A B C" kilns.

"What have you got that sign 'Hands Off' posted outside your works for?" asked the curious individual. "Because," returned the jocular mill owner, "my men are on strike."

Mr. Henry M. Whitney, of Boston, has been elected president of the Newfoundland Timber Estates Company, recently organized to operate in Newfoundland. The company controls 1,760,000 acres of timber land, owns seven mills, and is capitalized at \$4,500,000.

CRAIG MINE CRYSTAL CORUNDUM WHEELS

Our Pure Crystal Corundum Saw Gummars have no equal for their rapid, cool, cutting properties.



Read the following from Bulletin 180 of the United States Geological Survey, which says:
 "Often a distinction is made between emery and corundum, many persons not recognizing emery as a variety of corundum.
 Emery is a mechanical admixture of corundum and magnetite or hematite. It is, of course, the presence of corundum in the emery that gives to it its abrasive qualities and makes it of commercial value, and the abrasive efficiency of emeries varies according to the percentage of corundum they contain."

Emery is imported, mined by Greeks and Turks and contains only about 25% corundum. Our Crystal Corundum is guaranteed to be 98% pure alumina, a Canadian product, mined and manufactured by Canadians for Canadians.

HART EMERY WHEEL COMPANY, Limited, Hamilton, Ont., Can.

WOOD PULP ~ DEPARTMENT

THE PULP INDUSTRY OF QUEBEC.*

By F. W. EVANS.

For the economical production of pulp three things are virtually necessary, an abundant supply of spruce, never failing water powers, and good shipping facilities. The province of Quebec possesses them all: Our black and white spruce forests are larger than those of any other country in the world, in fact the only two that can be compared with it are the United States and Scandinavia, and both these, more particularly the United States, are rapidly depleting their wood supply, while the province of Quebec has enormous areas which are practically untouched. The failure of the wood supply in the United States, however, constitutes a danger to this country. American paper mill owners, realizing the possibility of a curtailment and even a stoppage of their supply of raw materials, have been looking across the border for relief, and in addition to purchasing wood from jobbers, have been buying up immense areas of timber limits, building mills for sawing and peeling the wood, and are shipping it by rail or boat to their mills across the line. To the casual observer this appears a desirable business—to sell our wood and at the same time clear our lands, and prepare them for the plough, but such a conclusion is very superficial. Pulpwood exported as such represents a value of about \$4.00 per cord to the Canadian, the same cord of wood if manufactured here into a ton of mechanical pulp is worth about \$12, a large part of which is for labor. A ton of chemical pulp requires two cords of wood, and is worth about \$30.00. If therefore the pulpwood exported last year to the United States had been manufactured into mechanical pulp, the province would have been over \$3,000,000 richer, and the gain would have been still greater if made into chemical pulp. Nor is the loss sustained by the country in exporting raw material instead of more or less finished goods the only one. Canada is endeavoring to sell pulp and paper to Great Britain particularly, and in a less degree to Germany and France; the Americans are trying to do the same, and are therefore competitors in the same market we are to-day supplying them with raw material to produce the pulp and paper to compete with us. But even this is not all, this industry in the United States is practically a huge combine and their policy is to limit the amount of paper and pulp on the home market to a specified quantity and slaughter the balance in foreign countries; so that the Canadian manufacturer often has the mortification of seeing American-made paper and pulp for which the raw material has been furnished by Canada, going to Europe, perhaps in the very same

steamer as his own, to undersell him in that market.

There are in the United States at present 255 pulp mills, mechanical and chemical, producing daily some 8,450 tons, or over two and a half million tons per annum. This means a consumption of about 13,000 cords of wood daily, or nearly four million cords per annum. Of this it is computed that the province of Quebec furnished last year about 400,000 cords, and this will be nearly doubled in 1903. It is, however, most difficult to get accurate figures of the quantity and value of pulpwood exported annually, as the government returns are useless, much of the wood going out as cord wood. Some idea of the rapidity with which the wood lands are being denuded of timber may be gained when we consider that the consumption of wood in the United States last year for the production of pulp would have taken the timber from an area of over 1,100 miles, for a width of over three miles, and this consumption is rapidly increasing.

In spite of the lack of assistance in this direction from successive governments, whether Conservative or Liberal, the pulp industry has grown very rapidly in the province of Quebec. In 1880 there were a few scattered mills whose combined output did not exceed 9,000 tons per annum, and of which the only ones of any importance were those of the Canada Paper Company and W. & F. P. Currie, now the Dominion Paper Company. To-day there are in the province 27 mills, the estimated output of which is about 280,000 tons per annum.

Here, then, is an industry which in twenty-three years has increased from an output of 9,000 tons to over 280,000 tons, which when the mills now projected or under construction are completed will reach over 330,000, and yet is only really in its infancy when its future possibilities are considered. In 1901 Great Britain imported one half million tons of pulp valued at eleven and three quarter million dollars, of which Canada furnished 13 per cent., or just exactly double the proportion we had exported there two years previously. The United States in the same year took from us 51,000 tons, valued at \$1,635,000, and we appear to have furnished about 79 per cent. of their total import of wood pulp. Our exports to other countries were inconsiderable, totaling only about \$65,000. It would, therefore, appear that we have in Great Britain an unlimited market for wood pulp, for if the whole output of the mills now operating and under construction in the province of Quebec were shipped there, we should only be furnishing about 60 per cent. of her imports, and as I have already shown that Canada, and more particularly this province, has all the requirements for the production of the best pulp at the lowest possible price, we should take every means to

conserve our raw material and not allow it to be sent out of the country to aid our rivals to successfully compete with us.

PULP AND PULP WOOD DUTIES.

Apparently the pulp trade have decided not to accept as final the decision of the Board of Classification of the United States General Appraisers rendered March 23rd last. The Board on that date upheld the action of American customs officials in levying a countervailing duty on wood pulp imported from the province of Quebec. F. W. Meyers & Company, of Rouse's Point, N. Y., representing wood pulp interests of the United States and Canada, engaged H. J. Cockinham, of Utica, to bring the question before the Board of Appraisers for review. At the hearing a few days ago he submitted evidence which he maintained warranted the Board in modifying its former decision sufficiently to hold that pulp wood cut on private lands in Quebec should be exempted from a countervailing duty when imported into the United States. Mr. Russell, of the Laurentide Pulp Company, Grand Mere, Que., said that about 52 per cent. of the pulp wood used by his company was cut on Crown lands and the rest on private lands. The Board will render a decision shortly.

Rossed pulp wood is the subject of a dispute between the importers thereof and the United States Treasury Department. On a quantity of rossed or peeled wood recently imported from Canada by the Remington-Martin Paper Company, of Norfolk, N. Y., the collector levied a duty of 35 per cent., he doing so, it is said, under instructions from the Treasury Department at Washington. The action aroused the pulp and paper manufacturers of northern New York, who appointed a committee to prepare and forward to the Treasury Department a statement of the position of the manufacturers in the matter. Heretofore pulp wood in all conditions has been imported free of duty. The imposition of a duty would indicate that the rossing of pulp wood is considered a process of manufacture. Should the action of the customs officer be confirmed it will add about \$3 a ton to the cost of producing paper.

Since the above was written the Treasury Department has issued an order directing that Canadian rossed wood be admitted free of duty until otherwise ordered.

PULP NOTES.

The employees of the Riordan pulp mills at Hawkesbury, Ont., have been given an increase of ten cents a day in wages.

It is reported that the two pulp mills on the Sissiboo river in Nova Scotia will be closed down until the market for pulp improves.

It is rumored that the MacLaren Company contemplate the erection of paper mills adjoining their pulp mills at Buckingham, Que.

It is reported that the Laurentide Pulp Company, of Grand Mere, Que., will double the capacity of their pulp mill at an early date.

Mr. Forbes Wood, superintendent of the pulp mill of the Carew Manufacturing Company at Holyoke, Mass., has been appointed superintendent of the Toronto Pulp & Paper Company's mills at Cornwall, Ont.

Price Bros. & Company, of Quebec, have their pulp mill at Rimouski nearly completed. It is believed to be

*Abstract of a paper read before the Insurance Institute in Montreal.

their intention to eventually engage in paper making, as experience has shown that there is little or no money in pulp where a long haul is involved.

The formation of a chemical wood pulp syndicate in Austria-Hungary is still engaging attention. The idea is to reduce production and advance prices. Some opposition is being shown by paper makers, who have petitioned for a concession to erect pulp factories of their own.

It is reported that the Newfoundland Timber Estates Company, in which B. F. Pearson, of Halifax, and H. M. Whitney, of Boston, are interested, will at once construct a pulp mill of 100 tons capacity daily on the line of the Reid Railway in Newfoundland, where the timber limits are situated. Several saw mills may also be erected.

A British patent relating to an improved drying felt for paper machines has been granted to E. R. The distinguishing feature is that felts are made in the form of double fabric, the upper welt consisting of soft spun yarn capable of being milled, while for the lower welt firm yarns are used which have as little capacity of extension as possible, and which may be furnished with a special strengthened lining.

The Pentecost timber limits, situated on the north shore of the St. Lawrence river, a few miles west of the Seven Islands, have been acquired by John McLennan, of Syracuse, N. Y., and other American capitalists. The syndicate has also acquired from the government several water powers which remained in the hands of the Crown after the limits were acquired by their former owners, Gagnon & Frere. The agreement with the government provides that at least \$300,000 shall be expended within three years in developing the property. It is said to be the intention to build a pulp mill.

The erection of the proposed pulp mill at the Chaudiere, by the Ottawa and Hull Power Company, has been deferred pending the settlement of the litigation and dispute over the rights to the water power privileges on the Ottawa river. The company had the pulp mill plans in hand, and John Kennedy, hydraulic engineer, of Montreal, had been engaged to look after the development of the power. As soon as the question of possession of water power privileges is settled, the company will proceed with work on the pulp mill provided they are satisfied that they will be able to develop enough power.

The Paper Trade Journal has been asked the following question: "Spruce being the principal wood used both for manufacture of ground wood and sulphite pulp, we will call the producing qualities of spruce as 100 per cent. for the sake of illustration; also the production cost of both kinds of pulp from spruce 100 per cent. What is the relative cost of production and the amount of wood necessary, as compared with spruce, of fir, poplar, red and white hemlock and sapling pine? Perhaps some of our readers will volunteer information.

Hon. Mr. Parent, Premier of Quebec, recently stated in the House that out of the 89,427 cords of pulp wood cut within the province during 1901-1902, on which no timber dues were collected, 11,015 cords were subject to a tax of 40 cent. The amounts paid were: Belgo-Canadian Pulp Company, \$1,039.20; Chicoutimi Pulp Company, \$1,754.60; Oumatchouan Pulp Company, \$2,288.80; Riordan Paper Mills, \$22,088.80; James McLaren Company, \$1,580.40; E. B. Fiddy, \$2595.60; Warren Curtis, \$5,205.05; J. E. Atkinson, \$778.05; John Breakey, \$95.55.

An examination for cullers will be held by the Province of Quebec at Hull on Monday, July 13th.

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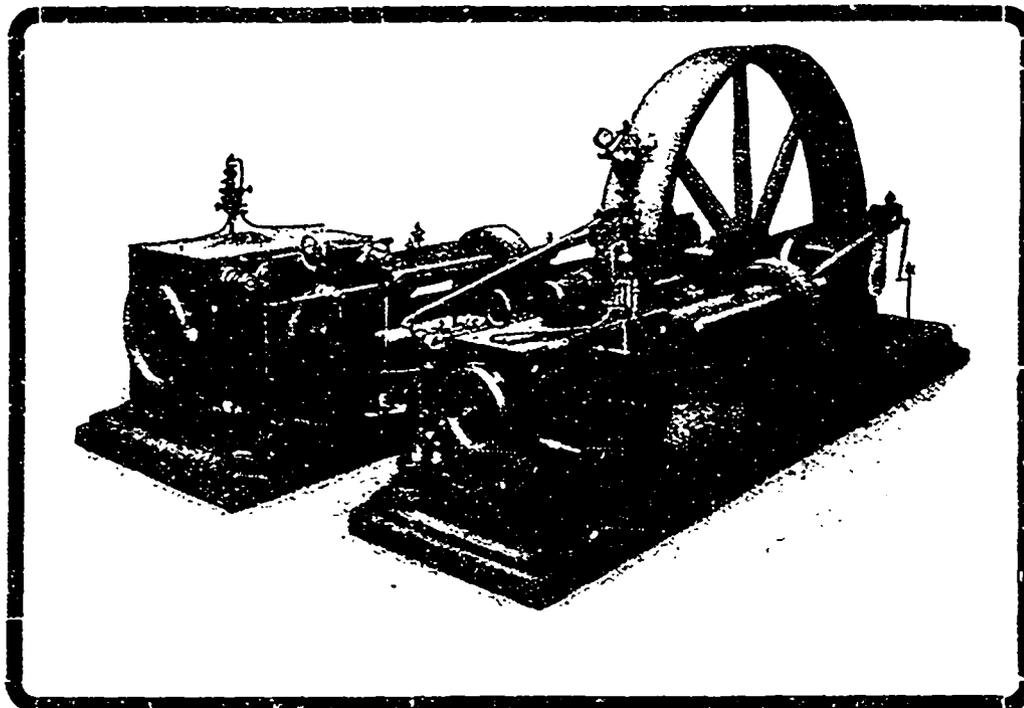
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MAPLE FLOORING.

The secretary of the Maple Flooring Manufacturers' Association of Michigan furnishes interesting facts and figures about that comparatively youthful industry. Architects well remember what a time they used to have in getting a good hardwood floor down. In the first place, it was a long hunt to find the kind and grade of lumber wanted; then, even if machined with unusual care on the best machine to be found, it was far from uniform, owing, it is said, to the fact that the harder woods in passing through caused the machinery to give in some way, so that if one cut off an end of a given piece that appeared all right, it was a chance if it matched well in the other end of the same piece. But after all this, when a workman undertook to complete the dressing process begun by the machine, it seemed as if the troubles had just begun—the cost of laying and dressing smooth by hand would perhaps nearly double the cost of flooring delivered at the building. So, therefore, when the maple flooring, thoroughly dry and well finished by special machinery, was placed on the market it made its way very rapidly. It was true, squared at the ends and so well dressed that no plane need be used after laying, a touch with the cabinet scraper here and there being all that was required. This improved way of placing the goods on the market originated in the west.

Well-made hardwood flooring was at first to be found in maple only, but now several kinds of hardwood are in use. Oak, which is very

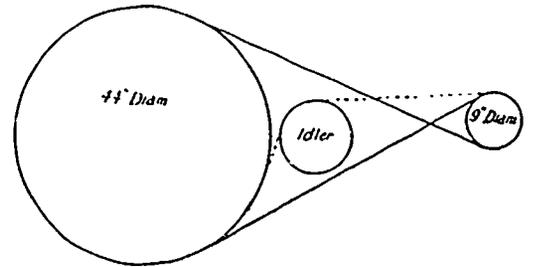
desirable for house floors, was some time in finding its way into the market in this form, if we remember, but now oak is to be had with the rest, and much birch is used, while beech is finding its way into stocks to some extent. Statistics as to output of "maple flooring" probably cover all these varieties, and all thicknesses. Originally most of the output was "3/8" stuff, but now quite a bit of "1/2" is sold for laying over old house floors, and although this is tongued and grooved, those who lay it recommend it as not weakened thereby so as to give them trouble in putting it down. However, "1/2" flooring is making its way into the market, and it will be readily seen that if skillfully tongued and grooved this thickness should prove very desirable for house work, for while it would have little durability in soft or loose-grained woods, one would chance it to wear many years in maple. Some 90 per cent. of all flooring sold in the Northwest is "2 1/4" face, while Eastern states, Ohio, and the export trade, use most of the "3 1/4" face. One large concern makes "1 1/2" face from strips that will not make "2 1/4," and sells it at about the same as the "2 1/4," but a demand for the narrower in large quantities would raise the cost to something like \$5.00 per M. above the cost of "2 1/4."

Maple appears to stand at the lead of the list for real wearing qualities. It is averse to dampness, and there are places where white oak would stand much longer. Opinions differ as to relative durability of the maple and birch in damp places and beech is too little known to say how it would behave in damp

situations. Oak stains easily, but the experienced housewife has most likely learned that she can have the stains removed from oak more easily than from the others. Owing also to its more open grain, marks and scratches show less in its surface than in the smoother and closer grained woods, while its color is a great advantage to its appearance in house floors. We would guess that beech trees would furnish flooring of more uniform color when laid and finished than either maple or birch.

A BELT PROBLEM.

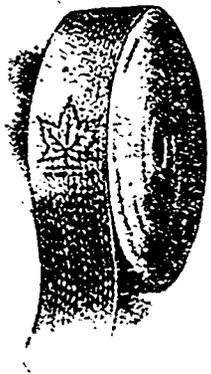
Sketch shows how I overcame the trouble we had with a short cross belt. The drive pulley is 44 inches and the driven pulley 9 inches. The distance between centers is 5 feet 8 inches. I believe every experienced man will admit this would be a hard belt to run. The loose pulley is 1 inch smaller in diameter than the tight one. By placing the



shaft out enough to make the belt run well on the tight pulley, it was simply impossible to keep it on the loose pulley. The full lines show how the belt did cross; the dotted lines show how it crosses now after putting a 12-inch idler on the slack side of belt. We haven't a belt in the shop that runs better, nor is it possible to get one that does.—"C. H. B.," in the Wood-Worker.

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LOSSES OF LUMBERMEN.

Many lumbermen sustained heavy losses by the recent forest fires in New Brunswick. It is estimated that 40,000,000 feet of timber was destroyed in York county. H. F. Eaton & Sons are probably the heaviest losers, 12,000 acres of their limits along the Upper Magaguadavic lakes having been burned over, in addition to a large area in the State of Maine. Other losses are estimated as follows: James Murchie & Sons, in York county, along the C. P. R. and on Magaguadavic lake, 12,000 or more acres; Major J. D. Chipman, 6,000 acres near Kilburn lake, in York county; F. H. Todd & Sons, 3,500 to 4,500 acres.

SPACING AND LENGTH OF BAND SAW TEETH.

The spacing of band saw teeth, as used on bands and band resaws, varies from 1 to 2 inches, but the greater majority run a spacing of about 1 1/2 to 1 3/4 inches. There is nothing

to recommend a longer spacing than the above, unless it is desired to run a long tooth with extreme hook. In such case, a 2-inch spacing may be used, with throat from 3/4 to 1 inch deep on a log band saw and from 3/8 to 9-16 on a band resaw, with large rounded gullet, quite similar to that run on a circular saw. Shorter teeth are usually preferred for hardwoods and frozen timber than are used for soft woods or summer sawing. Thus a 1/2-inch tooth is generally used for hardwoods in winter and a 9-16-inch in summer, while the teeth for soft woods range from 1/2-inch to 3/4-inch or longer. A style of throat that is very popular in many sections, and especially among the cypress manufacturers, is the rather long throat, with the base line about horizontal.

It is impossible to suggest that any particular style of tooth is best adapted to any particular wood, for the reason that all shapes of teeth are apparently used with success in different woods. Expert users of band resaws find

that for box-board work not over 12 inches wide, a spacing of 1 1/2 is satisfactory. In work demanding a minimum saw kerf and a moderate speed for saw, as in sawing picture backing, etc., a 2-inch spacing is found good. The same is true of resawing panel stock and hardwoods. Kiln-dried hardwood such as oak, hard maple, etc., tends to dull the saw very rapidly, unless the feed is well regulated, and it is well to have the saw stand a fair feed instead of simply allowing it to rub the dust away. Careful feeding of the saw in kiln-dried hardwoods will enable the saw to do good work in cutting considerable stock, where feeding without exercise of careful judgment may dull the saw in a few minutes. — PACKAGES.

The Davison Lumber Company is the name under which the American syndicate will operate the timber properties of E. D. Davison & Sons, of Bridgewater, N.S. The president of the company is J. M. Hastings, of the J. M. Hastings Lumber Company, Pittsburg, Pa.

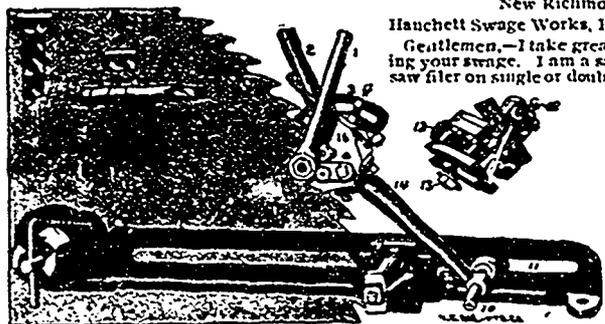
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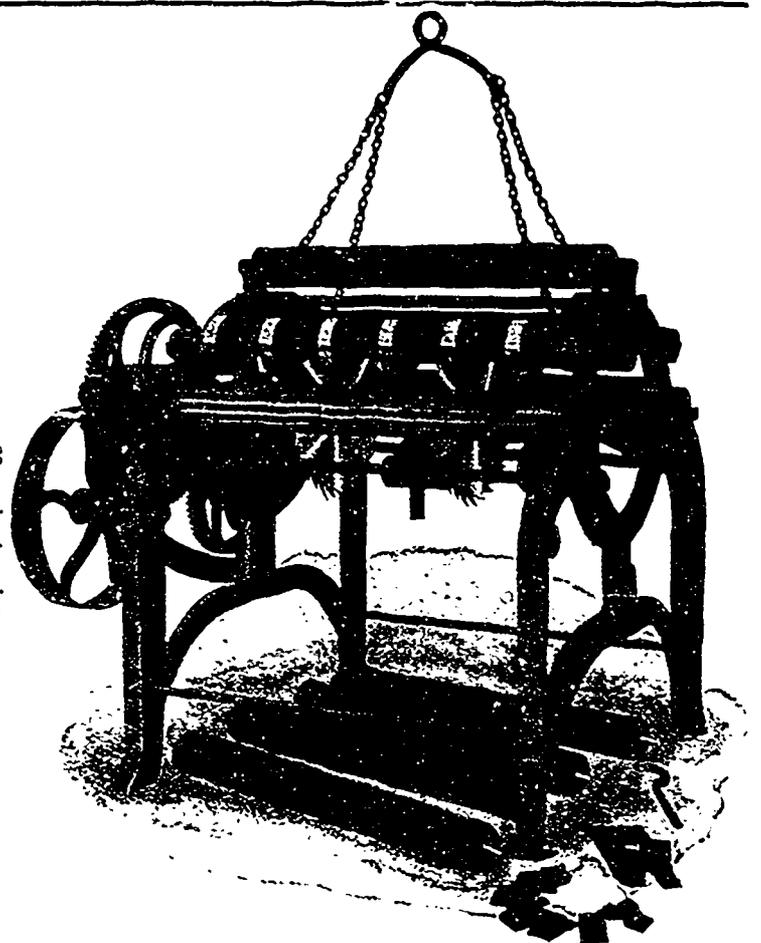
New Richmond, Wis., March 17, 1903.
Hanchett Swage Works, Big Rapids, Mich. :
Gentlemen.—I take great pleasure in recommending your swage. I am a saw maker and expert band saw filer on single or double cutting bands, and have used the different makes of swages now on the market and consider the Hanchett superior to all others for circular or band.
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M. E. ALLEN.
Mr. Allen is with Wil- low River Lumber Co. at a salary of \$10 a day.
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We also make Swages for Band Saws, Gang Saws and Band Resaws. We invite correspondence from Canadian mill operators and supply houses, mentioning this paper.

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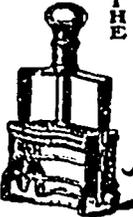
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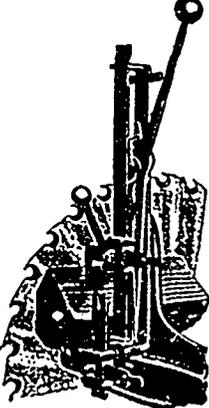
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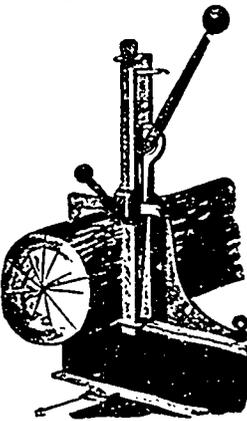
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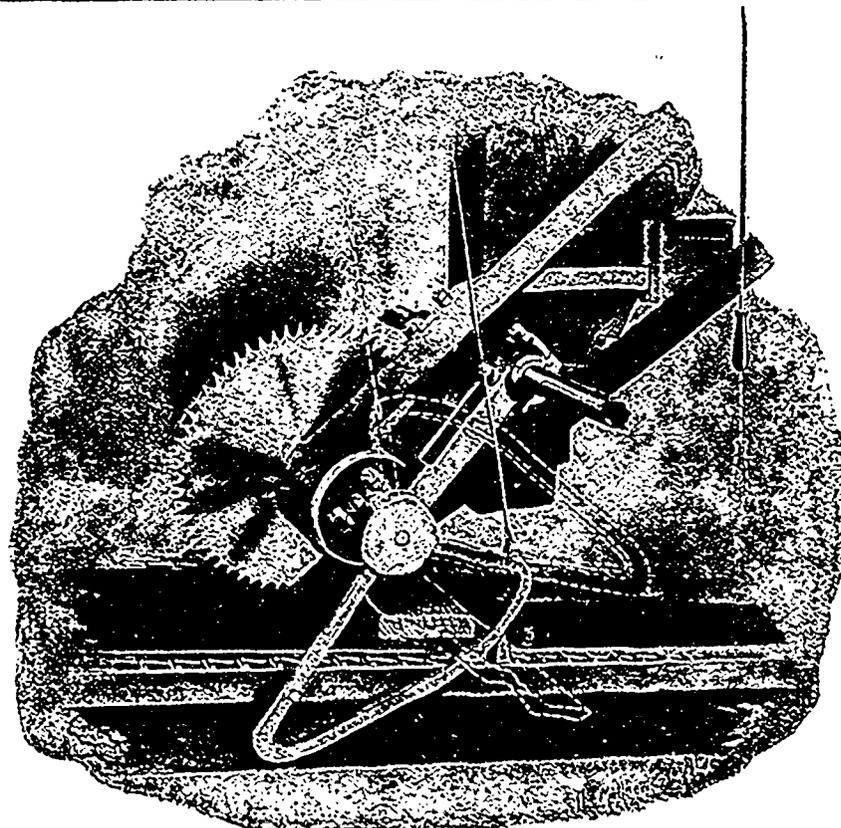
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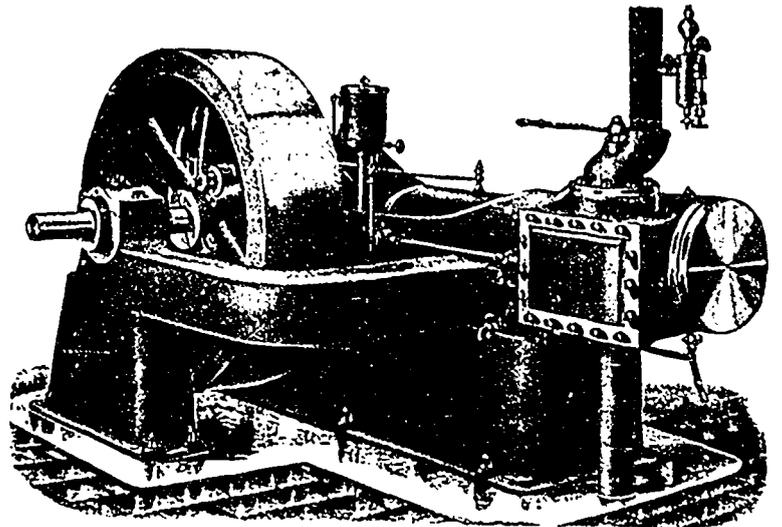
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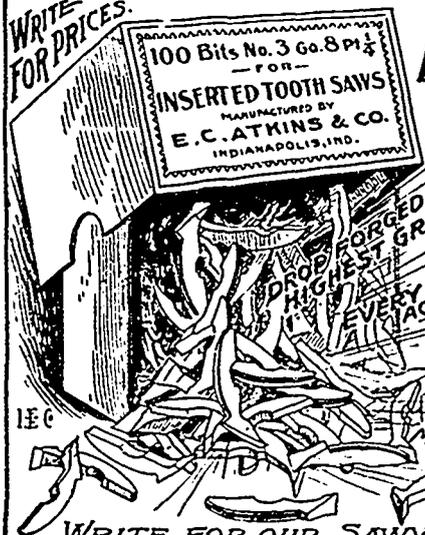
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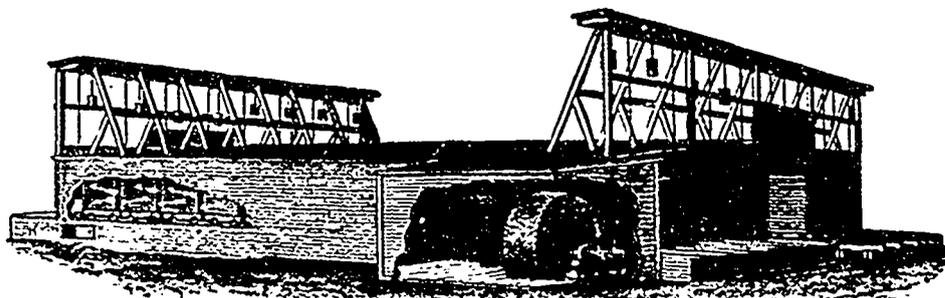
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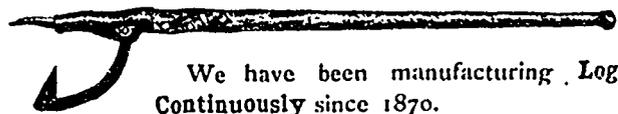
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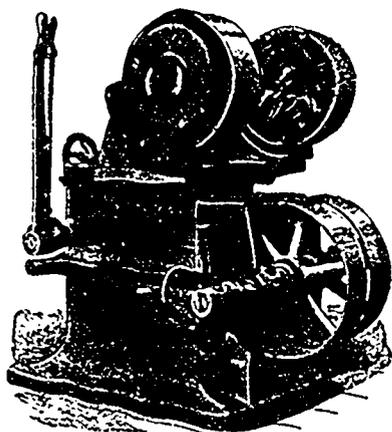
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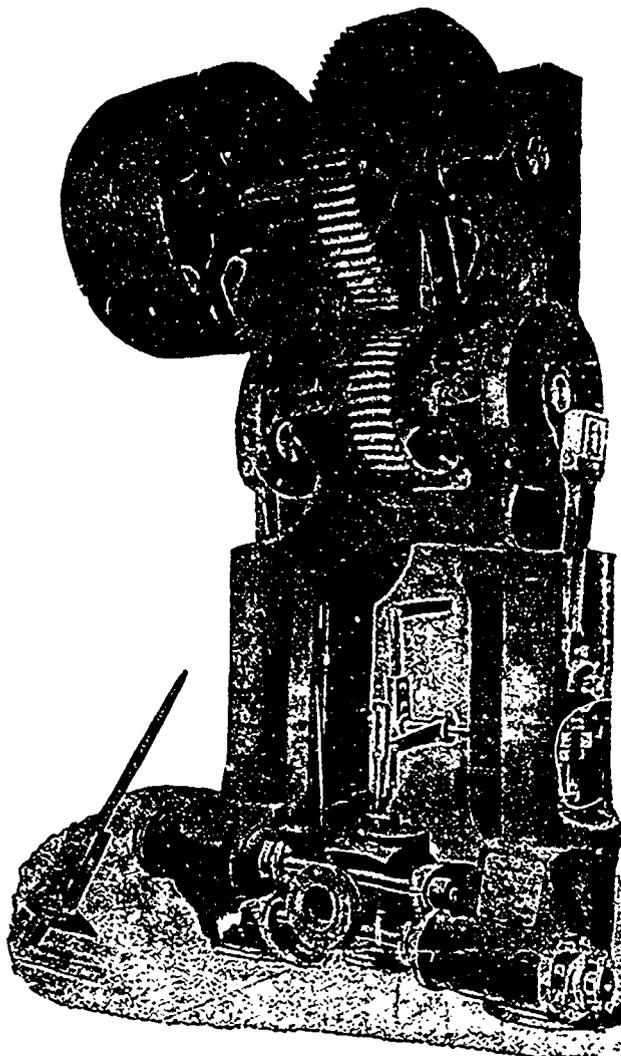
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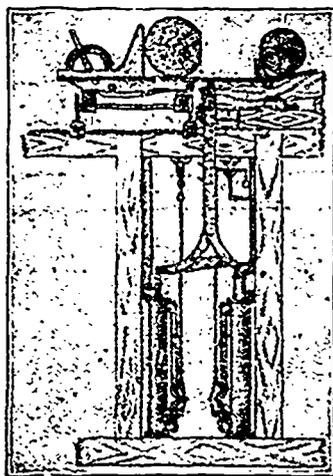
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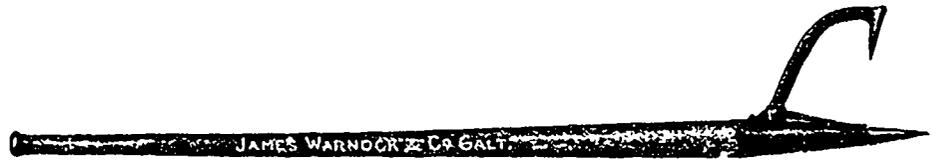
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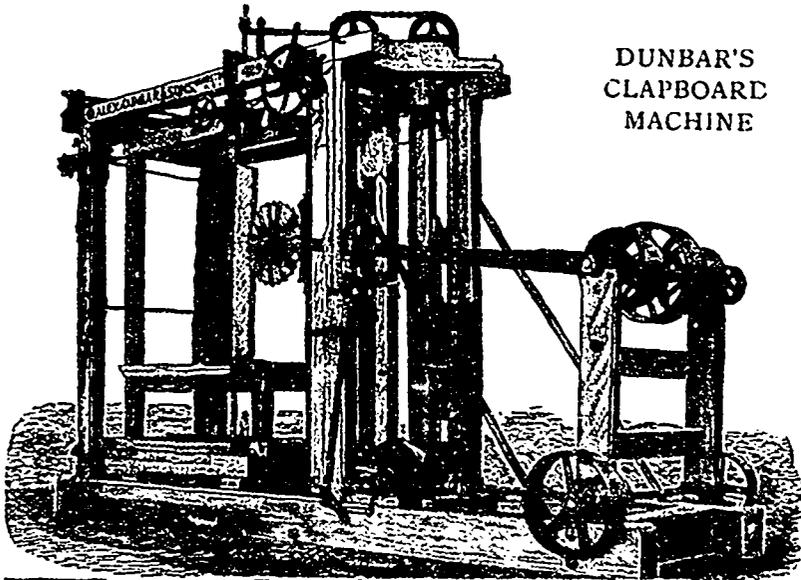


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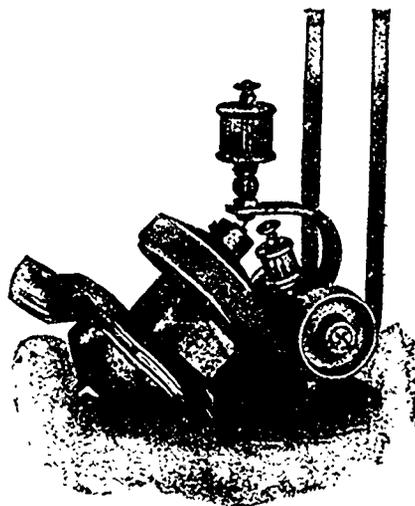
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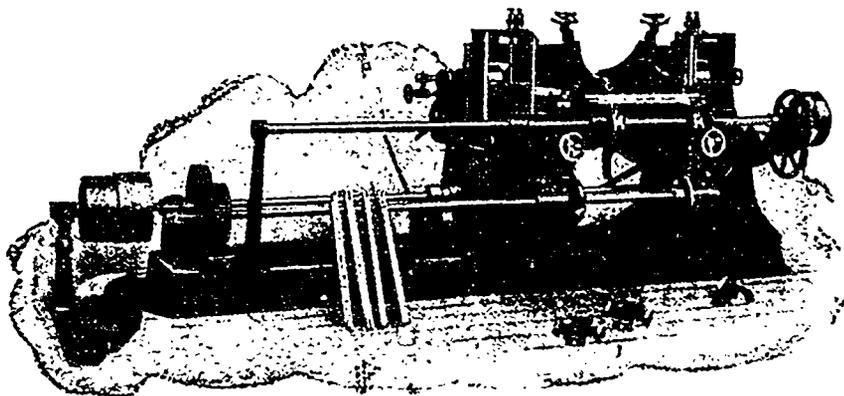
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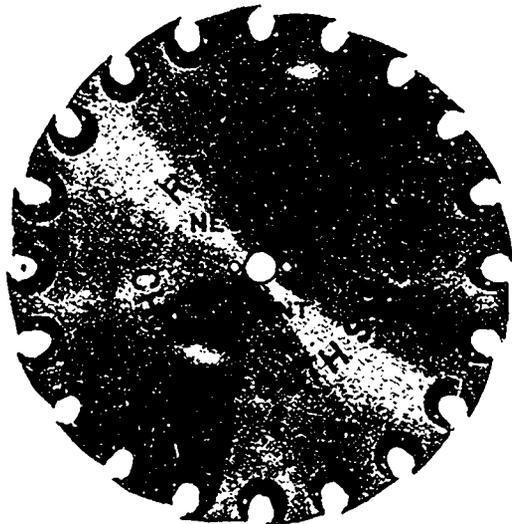
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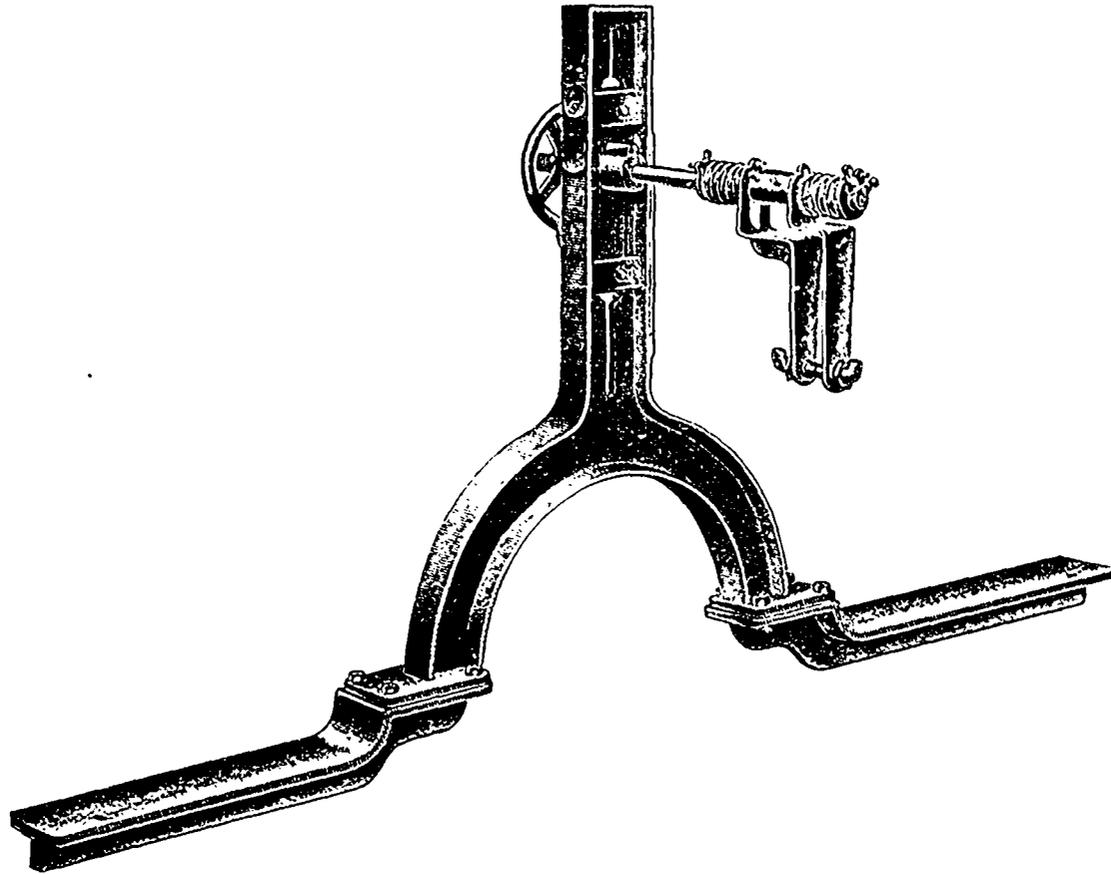
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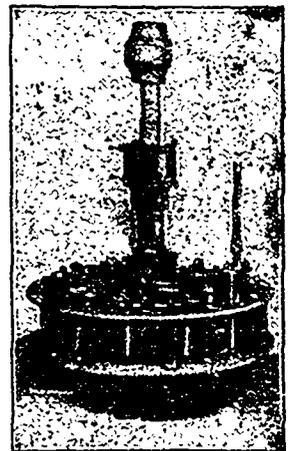
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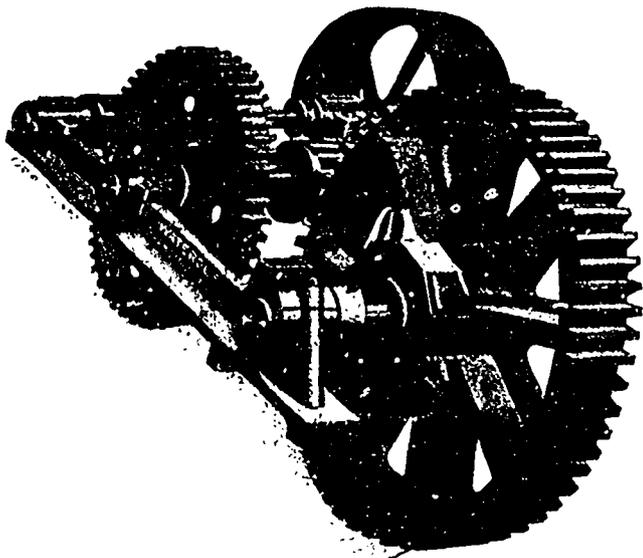
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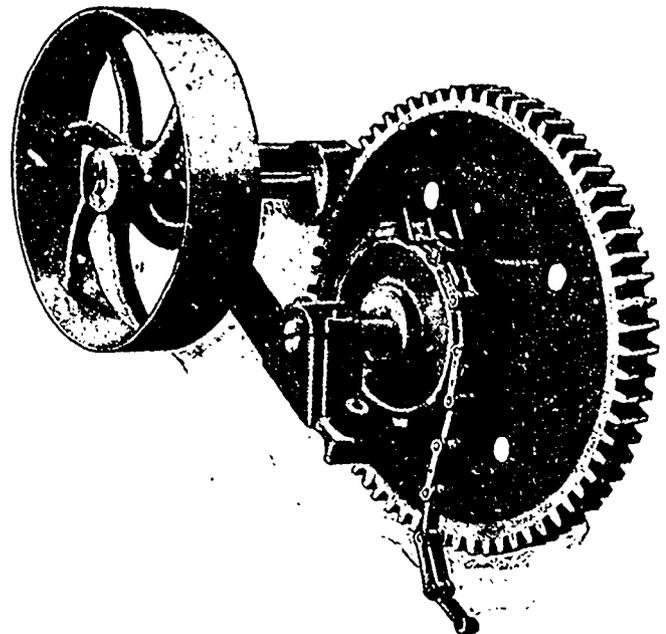
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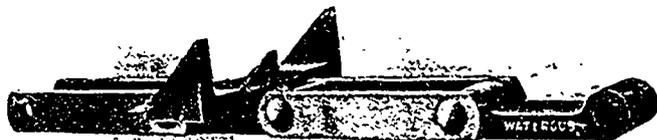
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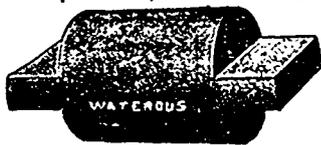


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Rivets 3/8", side bars 1 1/4 x 3/8", 8" pitch, center (cast steel) 2 1/4 x 6" pitch. Spurs 9" point to point.

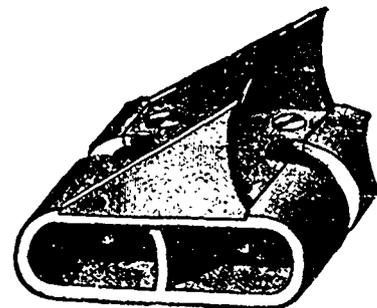
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Is 8" pitch similar to above, except that solid link is a drop steel forging, the pin is 1 1/4" in diameter (like illustration) and is fixed in position connecting side bars, presenting a large wearing surface for solid link. Side bars 2 x 1 1/2"

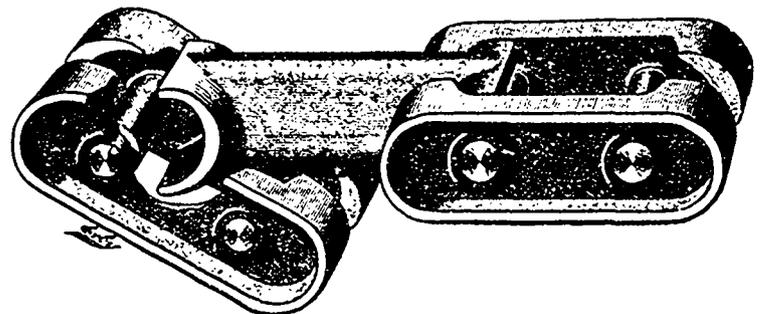


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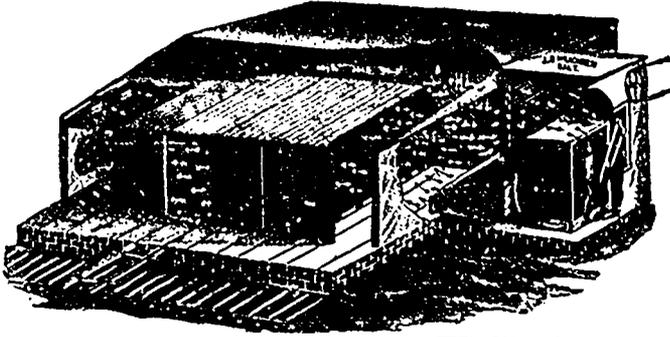
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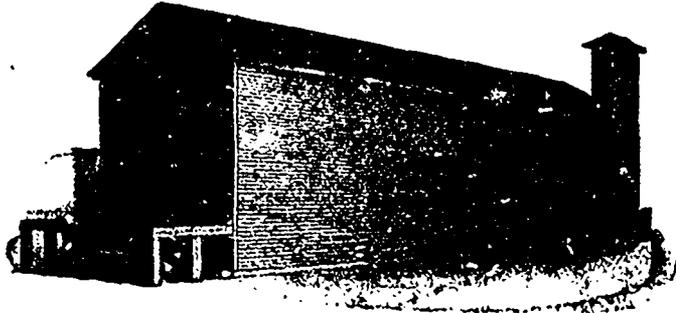
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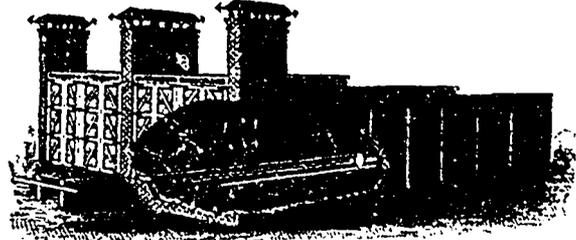
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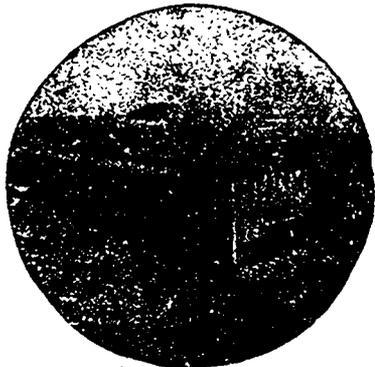
QUEBEC, January 31st, 1902.

Yours truly,
 (Signed) J. H. GIGNAC.

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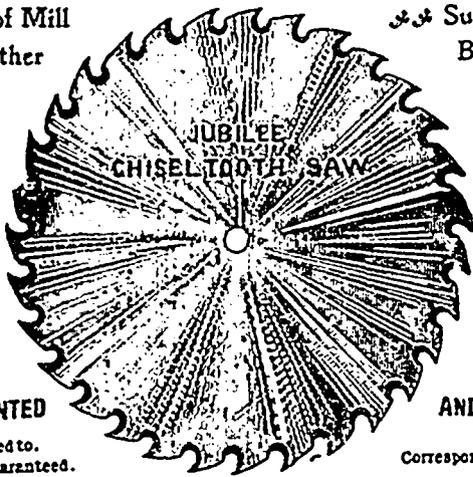
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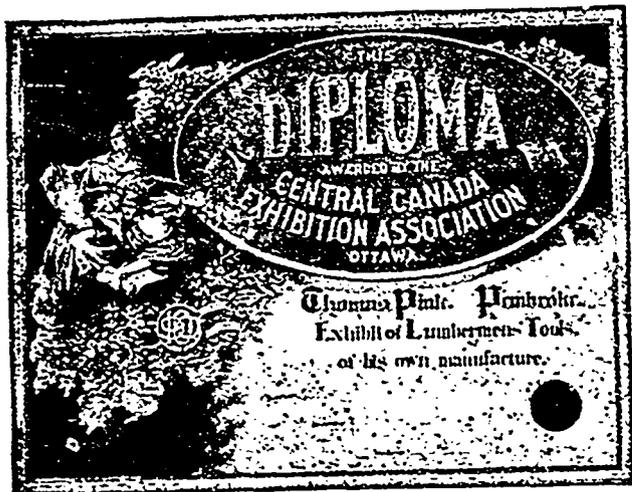
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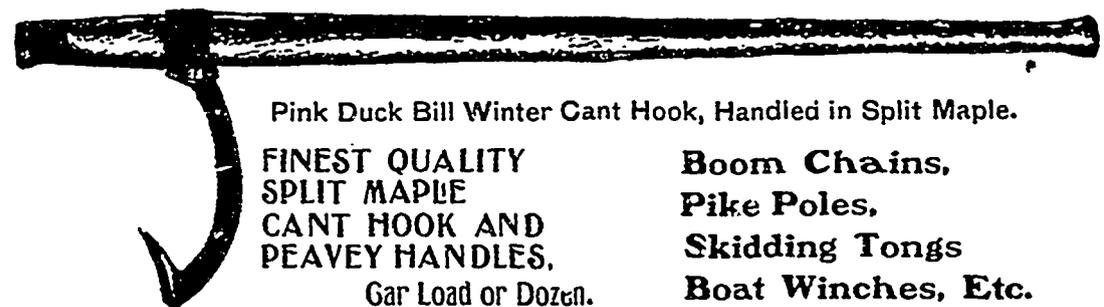


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