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DOMINION MECHANICAL & MILLING NEWS

DEVOTED ESPECIALLY TO THE INTERESTS OF OWNERS AND OPERATORS OF

Flour Mills, Saw Mills, Planing Mills and Iron-Working Establishments.

VOL. X.—NO. VI.

TORONTO, ONTARIO, JUNE, 1888.

Price, 10 Cents
\$1.00 PER YEAR.

THE "CASE" ROLLER MILL.

THE illustration appearing on this page represents the "Case" roller mill as manufactured by Messrs. Inglis & Hunter, of Toronto, under license from the Case Manufacturing Co., Columbus, Ohio. The machine is the invention of Mr. J. M. Case, President of that Company, and is regarded by millers as one of the very best appliances on the market for the grinding of wheat. The patentee and manufacturers claim for this machine that it is dustless and noiseless, has perfect adjustments, and the longest bearings of any roll made. The arrangement for trammimg and oiling the rolls and tightening the belts is one that commends itself to the mechanical mind. The doors for examining the stock and arrangement for leveling the rolls is simple and convenient.

By a simple device the rolls are thrown apart their entire length, and when brought together again they come back to their exact position, so that no resetting is required, no loss of time in testing and handling material, but the same results as before are had at once without experimenting. These rolls are provided with the "Case" Automatic Vibrating Feed, which requires no attention or adjustment, and never fails to spread the feed the entire length of the rolls.

Any further particulars regarding this machine will be cheerfully furnished by the manufacturers for Canada, Messrs. Inglis & Hunter, Toronto.

SAW MILL REFUSE.

By GEO. C. ROBIT.

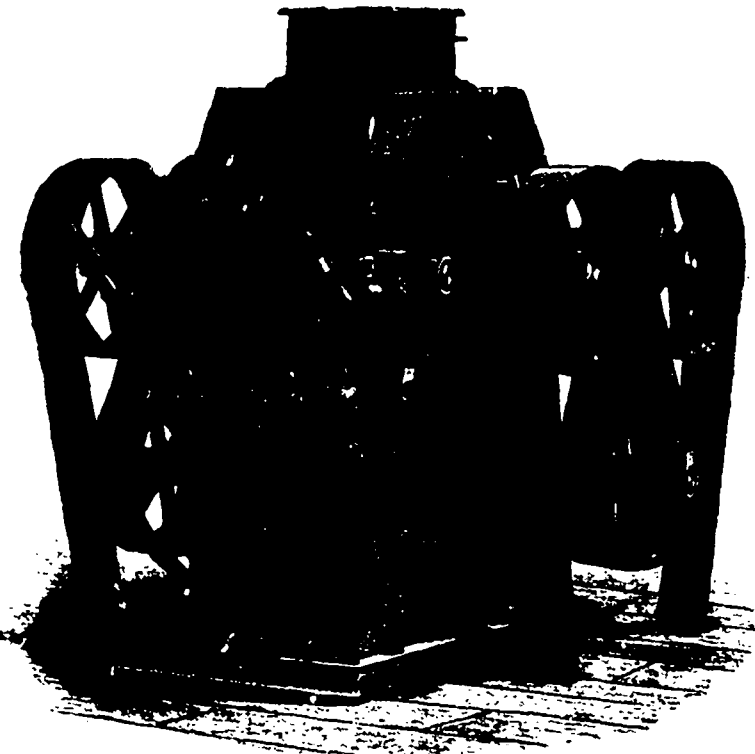
THE safe disposal of saw mill refuse is literally a burning question, and one which in many places is really a serious one and involves the expenditure of large sums of money. After the sawdust has been burned under the boilers in steam mills, and all that can be cut up into laths thus disposed of, there still remains a large amount of material which in one way or another must be got rid of. In earlier times the common way was by open fires maintained at a presumably safe distance from the mill, and to which the refuse had to be conveyed, often at considerable expense.

In more recent times furnaces have been specially designed, into which, by the action of machinery, the refuse is constantly discharged as fast as produced in the mill. For a large mill the furnace must be very large, and is very costly. In one case in Ontario the burner is over 30 feet in diameter and has a total height of 120 feet. The lower part has suitable openings for admission of air, and for entrance for repairs when necessary. It is really an iron casing, made of wrought iron plates, and lined with brick. This is about 60 feet high, and then tapers in till it is about 14 feet diameter, and thus is continued another 50 feet, and is crowned with a spark arrester. The refuse is carried up about 50 feet and is there discharged by a suitably shaped mouthpiece, so as to scatter the refuse over the bottom of the burner. This burner cost several thousands of dollars, and has been in use for several years with great success. The spark arrester frame is made of wrought iron piping, with the ends left open, so that air circulates through it and keeps it cool. This is covered with heavy wire netting, the meshes being about $\frac{1}{4}$ inch square.

This kind of a burner is only well adapted for large mills, as it must be of considerable height to insure safety, and the height necessitates a large diameter.

The two things necessary in a successful burner are: first, the prevention of the escape of burning pieces or sparks of size sufficient to cause a fire, and secondly, some means by which the heat generated may be dissipated without injury to the furnace itself, so that it might last for a reasonable time.

These ends can be attained by building a brick furnace covered in with an arch. The walls and arch should be double, with considerable air space between, or have a number of flues built in them. These flues should be open at the bottom, and be carried up higher than the crown of the arch in the form of short chimneys. By this means currents of air will constantly



THE "CASE" ROLLER MILL.

carry off the heat. The flue from the furnace itself should be carried horizontally for some convenient distance, and if near water, it would be advantageous to carry it out over the water, so that any burning pieces carried by the draught might drop into the water and thus be prevented from escaping by the chimneys.

The chimney should not be at the end of the flue, but at least four or five feet nearer the furnace. The entrance to the chimney should be as square and abrupt as is possible. The object of this is, while giving free vent to the escape of the smoke or heated air, anything more solid, such as pieces of burning wood, can not turn the abrupt corner leading into the chimney, but pass on into the space beyond. Locomotives are now frequently constructed on this principle, having a smoke box extension beyond the smoke pipe, and into this, sparks and grit from the furnace collect, instead of being driven out through the chimney and scattered over the train as used to be the case.

The chimney from the burner should be arranged to give ample draught, but by making the flue of some length, and by one or two bends in it or bridge walls, the velocity of the current may be checked, and so prevent the chimney becoming too hot, and in this way an ordinary smoke pipe may be used. Should it be necessary to put a spark arrester on top it will be found of great advantage to make the frame of it of pipe, with the ends all open, so that air may freely pass through, and so prevent the iron from becoming too hot.

The bottom of the furnace may be made with several low parallel fire brick walls to take the place of grate bars, and doors should be provided for getting in to repair or clean, either by having heavy iron frames built in, or a better way is to form openings into the brick wall with an arch top and build up in such manner that the opening can be made at any time without injury to the wall.

It seems a pity that so much material, which it has taken years of sunshine and rain to produce, should be wasted, as is so often done in saw mills, and yet what else to do with refuse, than burn it, involves problems not easily solved.

Perhaps when the problem requiring the transmission of electricity and its use as a motive power have been solved, this one will have solved itself, and saw mill owners will then be able to run their mills without any surplus refuse.

MANUFACTURING SHINGLES OUT OF SAW MILL REFUSE.

THE Chicago *Timberman* is pleased to see the question of economy about a saw mill receiving a fresh impulse from the introduction of machinery for the manufacturing of shingles from the refuse of the trimming saws. The fact has long been apparent that very much waste has of necessity been endured in the making of lumber in the past, but labor saving machines have in a great measure obviated that loss in many respects. The introduction of shingle machines that will make two or four good serviceable shingles out of the waste piece from off the end of a board, is a move in the right direction. One of these machines can be seen working in the planing mill of Mr. Zack Chase, of Flint, Mich., and it is turning out No. 1 shingles from the actual refuse of the mill. It is not so long ago that the *Timberman* was laboring to convince mill men that dressed lumber was more marketable than in the rough, and now nearly

all large mills have planers attached, and save the shavings for fuel in place of paying freight upon them. We now see the shingle machine at work to utilize the fragments which would otherwise go to feed the furnace fires. The next move will be in bringing into activity some of the thousand and one ideas for the adaption of sawdust to some practical use. On this point the *Timberman* will yet "speak a little piece," believing as it does, that this awful loss of percentage on lumber by sawdust can be in some practical and profitable way utilized and made valuable. There has been countless fortunes floated down the several lumber manufacturing rivers of this country, and it is only of late that close attention has been given to the economy so long needed. So all hail say we, to all means and methods for saving the laboriously gathered products of our forests.

"There is danger in building big saw mills," said a mill man to me the other day, "that isn't always taken into consideration. Even though the slow sawing policy is adopted, and the product of the mill is much less than might be expected with the same amount of machinery, the trouble likely to be encountered is the impossibility of getting the lumber away from the mill as fast as it is made. I have had some experience of this sort. It's all right for three or four hours in the morning, or even to well up into the afternoon, but before night the tall of your mill is likely to get littered up. Some of your mill men who are going to run day and night this year will find this so, and I want to go on record as predicting that some of them will shut down oftener to clear up the mill than to fix up their machinery."

MACHINERY & MFG.

THE POWER OF "SCIENCE."

An expert sat at his desk one morn,
And his visage was sad and his looks forlorn,
For no client had darkened his office door
In all that week or the week before.

He sat in his chair with a languid lop,
With his feet perched up on his roller top,
While his hands through his pockets vainly strayed
For the "wherewithal" for a "lemonade."

The ponderous volumes about him showed
That of weighty knowledge he carried a load,
With Mechanics and Statics and deep mathematics
And Thermodynamics he overflowed.



A step is heard on the stair below,
A step that his anxious ear don't know,
With visions of practice his pulses beat
As he puts on his glasses and lowers his feet.

The footsteps ascend. "Quick" a pen and a book,
Or something to give a professional look;
And when his two visitors entered you'd think
No time was allowed him to eat or to drink.

"One moment please, gentlemen, just be at rest
Until I arrange this report of a test."
"Then—" Then briskly, "Now, gentlemen, what can I do
To render myself of assistance to you?"



The clients advanced, angry, heated, and red;
"Here's a tenant of mine, see," the elder one said,
"To whom I am furnishing twelve horse or more,
While he isn't willing to pay for but four."
"Oh, you grasping old rascal! you'll make the man laugh
When he sees I can't use but three horse and a half,
My machinery is light, I have little to do,
And most of the time I am using but two."

"Be calm," said the expert, "We'll settle this case,
With professional dignity stamped on his face,
"With problems like this I have frequently dealt,
Let's see, to begin with, how wide is your belt?"



They looked at each other but neither could tell,
"We never have measured," the expert said, "Well,
Is it two, six, or four—can you tell somewhere near?
But the clients were stuck, they could give no idea."



"Then seizing his pencil he laid off a space
Of a width that he judged would apply to the case,
"About this width?" he asked. With a smile of relief,
They declared it exact to their honest belief."



"The diameter, now, of your pulley," he said;
But neither one seemed to have this in his head,
Until the old expert suggested the size,
By holding his hands to be gauged by their eyes."



"The speed of your shaft is the next thing to find,"
But neither could happen to call this to mind,
"Is it fifty, two hundred, or is it this speed?"
"There! there! that's just it," and thus point was agreed."



Then came from his table of logarithmic sines,
The value of 22, with which he combines
It, to allow for the belt being tight,
While the clients agree that 'tis wonderful quite."

The expert looked smilingly up from his task,
"How much do you make it?" they eagerly ask,
"Just six and eight hundredths-horse power exact,
And if figures don't lie there's no doubt of the fact"



"That's just what I told you," the landlord exclaimed,
While the tenant averred that is just what he claimed,
And both of the clients expressed their delight,
At the learning and wisdom that settled their plight,
His fee of ten dollars they willingly pay,
And in perfect agreement they bid him good day,
But their steps on the staircase had not reached the floor,
When the legend "Return Soon" appeared on the door



—Boston Journal of Commerce.

Mr. Sidney Smith will open a machine shop at Fort William.
The Rathbun Company, Deseronto, Ont., has 3,000 men in its employ.

The value of manufactures exported from Canada during the month of April was \$299,326.

A Toronto speculator is trying to get a bonus for the establishment of a foundry at Orangeville, Ont.

Messrs. Putton & Sons, of the Orillia foundry, have the contract to supply the hydrants required for the extension of the town waterworks.

Application has been made for supplementary letters patent to increase the capital stock of the Canada Jute Co., of Montreal, from \$50,000 to \$100,000.

The citizens of Fort William, Ont., are booming their town as a manufacturing center, and with that object are sending out circulars setting forth its advantages.

Extensive deposits of moulding sand, for foundry purposes, were discovered recently at Copetown, Ont., near Hamilton, and large quantities are being shipped to the States.

An exchange says that when wood is to be the fuel employed under a boiler, the grate area should be from 25 to 45 per centum larger than if coal were to be the fuel used.

Messrs. R. H. Smith & Co., saw manufacturers, St. Catharines, have resolved themselves into a joint stock company, limited, with a capital stock of \$75,000.

The Weldell Bridge and Machine Works, Trenton, Ont., are reported to have turned out over \$40,000 worth of work during the last three months, giving employment to about 40 men inside the shop.

Mr. W. H. Howell proposes to start a manufactory at Ottawa for the manufacture of paper from sawdust and saw mill refuse. Mr. Howell claims to have perfected the process for attaining this object.

An attempt was made recently to set fire to McInnes & Co.'s storehouse adjoining their oatmeal mill, at Ingersoll, Ont., but fortunately was discovered and extinguished before much damage had been done.

The roller machinery recently placed in the mills of Mr. Peter Campbell, Lachute, Que., for manufacturing rolled oats, was manufactured by Messrs. McQuat & McRae, of the Victoria Foundry, Lachute.

A Vienna engineer has just taken out a patent for a new smoke-abating process. By means of electricity he proposes to condense the solid part of the smoke as it arises from the coal, the carbon thus formed falling back into the furnace.

Messrs. Robt. Wood & Co., Oshawa, Ont., have purchased all the patterns and other apparatus of the estate of the Joseph Hall Works, together with a portion of the building, and intend to supply repairs for all machinery made by that company.

An electro-magnet with a carrying capacity of 300 pounds is attached to a crane in the Cleveland steel works, which readily picks up billets and other masses of iron without the aid of any device. A boy is thus enabled to do the work of a dozen men.

The estimated cost of the G. J. R. locomotive and boiler shops at Stratford, Ont., is \$110,000, towards which the city gave \$60,000 as a bonus. The car shops will cost \$150,000, and a bonus of \$60,000 has been provisionally voted by the city toward their erection.

So much water is drawn from the canal by the Cornwall mills that there is frequently not enough left to float vessels passing through the canal. The Montreal Board of Trade has asked the Government to interfere on behalf of the vessel owners and shippers.

The smallest electric plant in the world is what is claimed for the one at the Morton House, New York. It consists of a Corliss engine, Edison dynamo, shafting, pulleys, incandescent lights, etc. It is inclosed in a glass case three feet long, 1 1/2 feet wide and 2 feet high.

A singular case is to occupy the attention of the people of Woodstock. About two years ago the town gave the Patterson Company a bonus of \$35,000, exemption from taxation and water rates, to induce them to remove their manufactory to Woodstock. The company put in operation a condensing engine which used so much water that the pressure on the water mains was reduced thereby to an extent which rendered the service inefficient in case of fire. The town authorities hold that the use of the condenser

is contrary to the agreement. The Patterson Company on the other hand claim that under the agreement they are entitled to all the water they require. The courts will probably be asked to decide the matter.

In selecting iron don't depend upon the brand, except to ascertain that it was made by a reputable manufacturer, but require a certain tensile strength (T. S.) and proper percentage of ductility, and make sure that the sample piece cut from a sheet and properly tested comes up to the requirements.

The smallest circular saw in practical use is a tiny disk about the size of a British shilling, which is employed for cutting the slits in gold pens. These saws are about as thick as ordinary paper, and revolve some 4,000 times per minute. The high velocity keeps them rigid, notwithstanding their thinness.

A Washington dispatch says: Supervising Inspector Lublock, of San Francisco, having reported to the Treasury Department that petroleum is not safe fuel for large boilers, has been instructed by Secretary Faltchold to withdraw all permits heretofore given for its use, except in the case of small steam launches.

An application for incorporation will be made to Parliament by the Electric Construction and Power Company. The capital stock will be \$100,000. The names of applicants are Hon. J. J. C. Abbott, T. G. Shaughnessy, Robert Archer, J. A. Brewer, W. H. Kingston, John B. Abbott and Geo. A. Buayes, all of Montreal.

It is reported that a site for a rolling mill has been offered at the Humber by the Toronto Bolt Works Company to the Ontario Rolling Mill Company, of Hamilton, who recently purchased the rolling mill plant of Mr. Muir, London, and there is every reason to expect it will be removed from London to Toronto, and a suitable building erected.

Messrs. Stahlschmidt & Co., Preston, Ont., have paid back to the Preston corporation the amount of the loan made to them by that village, although it is not due for a long time yet. The interest was deducted from the amount and the company gave the Cornhill good security as to filling their contract regarding the number of hands to be kept at work during the next ten years.

A company is said to have been formed in Valencia, Spain, to establish an electrical plant, which is to furnish all the power required in the various manufacturing industries in and about the city. It is to be capable of producing 5,000 to 4,000 horse-power, and to transmit it to distances within the limit of 35 English miles. The plant is to be run by the water-power of the Turia river.

Mr. Hugh Scott, a well-known Toronto underwriter, who was summoned to give evidence regarding insurance matters before the Combines Committee, referred to the great destruction of property by fire every year, and urged that the Government should pass regulations for the prevention of fire in the same way as they have passed an act for fencing in of machinery to prevent accidents.

The Kingston & Pembroke Iron Mining Company last year mined about 28,040 tons. There is a demand for the ore because of its excellence in the manufacture of Bessemer steel. The management expects that it can sell all it can mine, as there is increased demand as quality of the ore becomes known among the iron men of the United States. The company have four mines in operation, with an output of 300 tons per day.

A company has been organized in the Southern States with a capital stock of \$1,000,000 to operate a new process of steel made from phosphorous iron ore. The process is the invention of the State Geologist of Georgia. A cheap and simple chemical preparation is injected into the blow pipes of a blast furnace and every trace of phosphorus is forced out with the slag and the iron is converted into Bessemer pig at an extra cost of only 20c per ton.

On opening a boiler much trouble is often experienced from the tearing of the manhole gaskets; this may be avoided by putting a little white lead on the face of the gasket that rests on the manhole plate, and by chalking heavily the other face of the gasket, as also the part of the manhole frame with which it comes into contact. On subsequently opening the boiler the gasket will generally be found to adhere firmly to the plate and to separate from the frame without tearing.

To cool a hot bearing, slack off the nuts on the cap, remove the oil cap, if there is one, and supply the journal freely with oil into which has been stirred the dust obtained by rubbing two bath bricks together. After some time you can set up a little on the nuts, and when they have been screwed gradually to nearly their former position, supply clear oil in considerable quantity; wash out the journal thoroughly. Then set up the nuts, and it will be a long while before that journal will give trouble.

The electric light in mills and factories means unquestionably a decided reduction of fire risk, although it was argued a few years ago that electricity, generated for instance by a running belt, was a new fire hazard. There is, however, a certain minimum risk in connection with the electric light, which is put forth in a number of rules just issued in the Society of Telegraph Engineers and Electricians. The principal danger, says the *Miller's Gazette*, is, of course, from overheating of the wires, caused generally by defective joints, or corroded wires, which resist the current, and cause a rise in the temperature, or a concentration of heat at the defective points. Bad joints and bad insulators are therefore to be avoided, and such work should only be done by competent men. The lamps should be enclosed in order to catch any flying sparks. Falling glass, and, above all, dynamos should not be installed in rooms where there may be inflammable material, or where the air is charged with dust.

M. Gerboe, it is stated, has devised an apparatus by which an audible and visible signal is given to the engineer if any part of the machinery to which the apparatus is fitted should become unduly heated. In its simplest form, as applied to the crank pin of a steam engine, the device consists of a small cylinder fastened to and projecting from the crank pin, and containing a plug of easily fusible alloy, which is pressed against the end of the crank pin by a perforated piston and spring. The piston rod, by means of a lever, connects a catch arranged to stop the motion of a bell placed

over the apparatus. The gear of the bell, which is actuated by a spring power, is previously wound up by hand and locked by the catch. If the crank pin should become heated, the fusible plug melts, thus allowing the piston to descend, thereby releasing the catch and sounding the bell. In addition to this audible signal, a disk hidden underneath the bell is turned in such a position that a bright color is seen through two holes in the disk of the bell.

TRADE NOTES

Jos. Dixon; Stanton, is changing his mill into a full roller mill, using the Geo. T. Smith machinery and plans.

The Geo. T. Smith Co. will make the necessary repairs to Hunt Bros' mill at London, recently damaged by fire.

Mr. A. Ellis, of Balsam, has just purchased and placed in his mill one of Wm. & J. G. Greey's improved flour dressers.

A large marine boiler is being built by Messrs. Inglis & Hunter, of this city, for Mr. Mark's tug "Mary Ann," of Port Arthur.

T. B. Bragg, Cumminville, is changing the Dacotah mill from stones to rolls, using the Geo. T. Smith machines and short system plans.

Mr. L. L. Sage, of Ayton, Ont., is putting in additional roller mill machinery, and has placed his order with Wm. & J. G. Greey, of Toronto.

The Shoal Lake Milling Company, of Winnipeg, Man., have bought one of the new style 3-roll feed grinders from Wm. & J. G. Greey, of Toronto.

Mr. F. W. Fowlds, of Hastings, Ont., has purchased two No. 2 Improved Bean's patent dust collectors from Wm. & J. G. Greey, of Toronto.

Sandy McVean, Dresden, has recently completed a 75 bbl. mill on the full roller and centrifugal system, built by the Geo. T. Smith, M. P. Co., Stratford.

Bickle & May, Petrolia, whose mill was burnt in April, have contracted with the Geo. T. Smith M. P. Co. for a 75 bbl. short system full centrifugal roller mill.

Way & Co., Pefferlaw, have contracted with the Geo. T. Smith M. P. Co. for one of their three break full centrifugal 100 bbl. mills, to be completed June 30th.

V. Denne, Newmarket, is changing his mill from stones to rolls. Will use the Cochrane rolls, the Geo. T. Smith Co. furnishing the other special machines and iron work.

Messrs. Inglis & Hunter are constructing two large boilers for the Massey Manufacturing Co. from newly designed plans by the Dominion Safety Boiler Co., Montreal.

Jos. Martin, Milton, has made contract with the Geo. T. Smith M. P. Co. to change his stone mill to rolls, using their three break full centrifugal system, 100 bbls. capacity.

Mr. D. McMillan, of Barrie, has purchased some additional rolls for his mill, intending to increase its capacity. Messrs. Wm. & J. G. Greey, of Toronto, have the order.

Messrs. Craig & Sons, Napanee, finding additional machinery necessary to compete with other mills, have ordered a double set of 9x15 rolls from Messrs. Wm. & J. G. Greey, of Toronto.

S. R. Stuart, Mitchell, is changing his mill to a full roller mill, throwing out his middlings and chop stones and substituting therefor the Geo. T. Smith roll frames and three high chop mill.

Campbell, Stevens & Co., Chatham, have made contract with the Geo. T. Smith Co. to change their St. Thomas mill from a six to a three break mill, increasing the capacity from 250 to 500 bbls.

Messrs. George Wright & Bro., of Wareham, Ont., have placed an order with Mr. E. P. Cave, of Thistleton, for a line of rolls and other machinery to be supplied by Wm. & J. G. Greey, of Toronto.

Mr. J. E. Sproule, of Colborne, Ont., is fitting up his mill with considerable new machinery. He has purchased his rolls and other supplies, consisting of belting, cups &c., from Wm. & J. G. Greey, of Toronto.

Messrs. Inglis & Hunter are increasing the size of the cylinder of the engine in Messrs. McLaughlin & Moore's flour mill, Toronto. When the change is made the capacity of the engine will be 200 instead of 200 h. p.

Messrs. Inglis & Hunter, of this city have just successfully completed compounding with independent condenser the cylinder of the engine of the Blind River and Georgian Bay Navigation Co.'s steamer "Belie Wilson."

Mr. David Elder, of Elder's Mills, is fitting up his mill with a full line of rolls from the shops of Wm. & J. G. Greey, Toronto. Mr. Elder will also use Greey's system, and Velocity middlings purifiers and centrifugal.

Messrs. Wm. & J. G. Greey have filled an order from the Toronto Street Railway Company for a run of 4 ft. millstones, as the company's facilities for grinding provender were not sufficient to meet the requirements of their increasing business.

Mr. W. H. Berkeley, of Canby, Ont., has placed an order with Wm. & J. G. Greey, of Toronto, for a line of 9x15 rolls with Greey's new connected rope drive, also flour dressers, purifier, scalpings, dusters, etc., for a full roller 50 bbl. mill.

We understand the Canadian Rubber Co., through their Toronto agent, J. H. Walker, have secured the contract to supply Messrs. Gooderham & Worts with all the belting necessary for their large elevator just nearing completion in this city.

The 75 bbl. mill of the Macfarlane Milling Co., Sherbrooke, Ont., built by the Geo. T. Smith M. P. Co. on their three break full centrifugal system, was successfully started on Saturday, May 27th, and is now running two weeks by high water in the river.

The Vulcan Iron Co., of Winnipeg, have added to their plant machinery for grinding and corrugating millers' rolls. Up to the present this work has been done in Ontario.

Messrs. Gould Bros. are changing the style of drive on the roller machines in their mill at Uxbridge, and are putting in Wm. & J. G. Greey's new system of rope drive and coupled rolls. It is expected a saving of one half in power will be effected by this change.

Messrs. W. C. Sylvester & Sons, of Vankleek Hill, Ont., have decided upon remodelling their stone mill to the roller process. Messrs. Inglis & Hunter, of this city, will make the changes, putting in the case system. The mill will have a capacity of 100 barrels.

We learn that some large rubber belt ranging from 20 to 48 inches, with five, six and seven ply, one of which weighs no less than 6 tons, have recently been supplied to elevators throughout the country by the Canadian Rubber Company, Montreal and Toronto.

The Ogilvie Milling Co., Winnipeg, have recently changed their bolting system, putting in ten No. 0 Geo. T. Smith centrifugals made at Stratford. They are also making extensive changes in their Glenora mill at Montreal, the Geo. T. Smith Co. furnishing the necessary supplies.

The Geo. T. Smith Middlings Purifier Company, of Jackson, Mich., will exhibit a model mill equipped with their machinery at the Millers' Convention in Buffalo, N. Y., in June. It will also be displayed at Cincinnati, Ohio, from July 4 to October 27, during the world's exposition. It will cost \$10,000 and can be transported on a single car.

The Vulcan Iron Works, Montreal, are building a steel steamer for the Ottawa River Navigation Company, the size of which is 160x25x8. The firm are also building two large boilers and four large tanks and coolers for Dams & Co., of Lachine, and are cutting the steamer Algonquin in two and will connect her again at Ogdensburg. An addition of 4090 feet will shortly be added to the present works.

Mr. J. H. Dracass, of Streetsville, Ont., has ordered a line of 9x24 rolls from Messrs. Wm. & J. G. Greey. These rolls are to be fitted up on the new system introduced by the above firm, which is reported to be giving satisfactory results at Port Hope, Holland Centre, Kirkfield and Blytheswood. The bolting machinery will consist of 8 new style flour dressers and two centrifugals, also built by the Messrs. Greey.

Messrs. J. & R. Kidd, of Tilbury Centre, are preparing to enlarge and improve their roller mill. The building will be raised 10 feet, and a new roof put on to accommodate the new plant. Messrs. Wm. & J. G. Greey have the order for a line of 9x18 and 27 rolls with their new connected rope drive, also for the additional flour dressers, scalpings, etc., it being the intention to make one of the most complete mills in Western Ontario.

Mr. Robt. McGowan, who is building the new roller mill at Durham, Ont., has contracted with Mr. E. P. Cave, of Thistleton, to fit up the machinery and supply the same. Messrs. Wm. & J. G. Greey, of Toronto, will supply the entire outfit, and a line of their new style connected rolls with rope drive will be one of the main features. Mr. McGowan is owner and builder of the mill at Priceville, which was also built by Mr. Cave and furnished by Wm. & J. G. Greey.

We are in receipt of a copy of the new illustrated and descriptive circular, issued by Messrs. John Gillies & Co., Carleton Place, Ont., manufacturers of Shipman and Acme Engines, and builders of steam launches. The size, weight, construction, durability, cost of running the Acme engines, etc., are fully explained, and every page contains valuable information. Copies of this circular may be obtained on application to John Gillies & Co., Carleton Place.

Messrs. Robin & Sadler, the well-known leather belting manufacturers, of Montreal, lately shipped to the Lake of the Woods Milling Co., Keewatin, Ont., about 7,000 feet of belting, ranging from two inches to two feet in width and weighing about 5,000 pounds. One double leather driving belt alone weighed 1,400 pounds, being 360 feet long and 24 inches wide. This is said to be the largest order for belting ever filled by a Canadian manufacturer, and its satisfactory execution reflects credit on the enterprising firm who did the work.

The firm of E. Leonard & Sons, of London, Ont., have, through their Montreal branch house, where they are represented by H. E. Plant, placed a number of their Leonard Ball Automatic Engines in Montreal, and they are becoming better known and more appreciated every day, for their economical and general efficiency and perfect regulation. A 60 h. p. engine has recently been placed in the drug mill of Messrs. Lyman, Sons & Co., and a 100 h. p. in the extensive planing mills of Y. Lefontaine. This firm's business now extends to all parts of Canada.

Placing a negative on paper prepared in the ordinary way for blue prints, then exposing them to sunlight in a manner similar to the exposure of a tracing and paper in a blue printing frame, and washing the paper in the same way as any ordinary blue prints, will produce an exceedingly pleasing impression or picture, which will be precisely similar to that of a photograph from the same negative. A picture thus produced will be of a bluish tint on white ground. Many manufacturers of machinery or specialties use this method to advantage for the purpose of illustrating their productions. *American Mechanic.*

Private advices from the West and Canada, says the *New York Lumber Trade Journal*, show that there is a great scarcity of box lumber. The large and rapidly growing West is a large consumer of this grade, and the visible supply from all sources this year will be greatly below the demand. Already our box makers are looking to other woods, such as spruce and North Carolina pine, for a substitute, but, notwithstanding this deflection, the demand is still enormous, and we predict that before the season is over there will be a good big jump upward in price. Box lumber at ruling prices is a good thing to hold.

MILLING IN WESTERN CANADA.

BY D. WYTH BUCHANAN.

In the last issue of this journal a brief description of a number of the roller flour mills of Manitoba and the Territories was given under the above heading. The list then given included only the mills along the main line of the C. P. R., from Winnipeg westward, and these were found to number fourteen flour mills and three oatmeal mills. This by no means concludes the list. There are a number of mills on the branch railways in Manitoba, and also several at points off the railways. On the Manitoba & Northwestern railway the first roller mill point reached, going north from Portage la Prairie, is the pretty little town of Minnedosa, on the crossing of the Little Saskatchewan River. The mill has 100 barrels capacity, and is operated by Jas. Jermyn. The mill is new, having only been completed last summer. Minnedosa is one of the oldest points in this part of Manitoba, and formerly a stone mill was located here. There are two elevators of about 40,000 bushels capacity each. West of Minnedosa, on the same railway, the next milling point is Shoal Lake, a new town which has come into existence since the construction of the railway, a couple of years ago. The mill here was commenced in the summer of 1886, but was not completed until the following season. The mill has a capacity of about 100 barrels, and is operated by the Shoal Lake Milling Company. There is an elevator in connection. Shoal Lake is becoming quite an important grain market, and at least one elevator will be erected there this season. Westward still on the same railway there is another mill, at Millwood, the crossing of the Assiniboine River. This is a new mill only completed last fall, and is operated by Mitchell & Bucknall. It has a capacity of about 100 barrels. This concludes the number of mills at present in operation on the Manitoba & Northwestern Railway. North of Millwood, and about ten miles beyond the Russell branch of this railway, there is a roller mill, at a point known as Asessipi, operated by the Asessipi Milling Co. This mill has been in operation for a couple of years, notwithstanding the distance from the railway, and flour has also been shipped eastward from the mill. The last named two mills are run by water power.

At Rapid City, the terminus of the Saskatchewan and Western Railway, a fine mill has been erected. This mill was completed and put in operation about a year ago, and it is one of the best mills in the province. The Little Saskatchewan River furnishes it with an excellent water power. The mill has already 250 barrels capacity, and is operated by McCulloch & Co. There are other water powers near Rapid City which could be utilized for milling. The town will be connected with Brandon, 25 miles distant, by the Northwest Central Railway, now under construction, and it promises to become quite a grain centre, being surrounded by a fine agricultural country. Rapid City was an important point previous to the construction of the C. P. R., and two stone grist mills were built in the vicinity, owing to the water power available. These mills have, of course, been superseded by the roller mills.

At Stonewall, the terminus of the Stonewall branch of the C. P. R., which connects the place with Winnipeg, a roller mill was established something over a year ago by Rutherford and Co., with a capacity of about 75 barrels. A stone mill, which previous to the days of roller milling, did quite a business in shipping flour to Winnipeg, was formerly located there, and has been transposed into the roller mill. About seven miles north of Stonewall, at Balmoral, another stone mill has been changed into the roller process, with a capacity of about 75 barrels, operated by Geo. Buckpitt. Being without railway service the mill is run mainly for local use.

At Morden, one of the principal towns on the Pembina branch of the C. P. R., there is a roller mill, operated by J. H. Fraser & Co., which has been established for a few years. It has a capacity of 100 barrels. Morden is a good grain town. There is also a smaller mill at Crystal City, on the same railway, operated by Cochrane & Manson. On the Manitoba Southern railway, a new mill has just been completed at Holland by the Holland Milling Company, at a cost of about \$8,000. It has a capacity of 75 barrels.

At Souris, or Plum Creek as it is sometimes called, south of Brandon, there is also a good mill, operated by McCulloch & Herriott. The location is some distance from the railways, Brandon being the nearest point, over 15 miles distant. The location was chosen on account of the water power furnished by the Souris River. The mill does quite a shipping trade, notwithstanding the haul to the railways. This gives a full list of the mills now in operation in Manitoba, exclusive of those previously noted as located on the C. P. R. main line. There are also quite a number of stone mills at points

all over the province, some of which are still in operation, though used mainly for local gristing purposes. In addition to the mills named, there are several projected and some in course of construction. At McGregor, on the C. P. R. main line, west of Portage la Prairie, there is a roller mill of about 100 barrels capacity, now well under construction, and which will be completed within a few weeks. The building is up and a considerable portion of the machinery in place. Whitelaw mill builder, of Woodstock, Ont., is building this mill. Then there is the large 1000 barrel mill at Keewatin, which will be completed within a short time. This mill, though located in Ontario just outside of the eastern boundary of Manitoba, properly belongs to and may be included in the list of the Manitoba mills. Several other mills are projected, and some will doubtless be built this season.

Outside of Manitoba, in the Territories there are also some roller mills not included in the list of those on the main line of the C. P. R. The first is the 100 barrel mill located at Fort Qu'Appelle, about 20 miles north of the railway, and operated by Joyner & Elkington. Some flour has been shipped from this mill eastward by rail, but the haul to the railway is too great to render it profitable. The mill, however, has a good local business. Another roller mill is located at Cannington, distant from the railway about 40 miles, the nearest point being Moosomin, on the main line of the C. P. R. These two mills are in the Territory of Assiniboia. Away north, at Prince Albert, in the Territory of Saskatchewan, there also a good roller mill, operated for some time back and owned by the Hudson Bay Company. There are also several grist mills at points in the Territories, especially in the settlement along the North Saskatchewan River, as far as Edmonton, Alberta. Before the construction of the C. P. R., the Saskatchewan River was the great highway, and consequently the early settlements were formed along that river. In the far northwestern portion of the Territory, at Macleod, Alberta, a mill will probably be erected this season, considerable stock having already been subscribed in a local company for this purpose. Among the projected mills in Manitoba, are one at Birtle and one at Neepawa, both prosperous towns on the Manitoba & Northwestern railway. Joint stock companies have been formed at each of these places, with good prospects of the mills being established at once.

In British Columbia there is yet but one roller mill, that of the Columbia Milling Company. The mill is located at Enderby, an inland district east of the Selkirk range of mountains. The nearest railway point to the mill is Sicamous, on the C. P. R., reached by steamers from the mill. Wheat of the best quality can be grown in the valleys of that portion of British Columbia. The mill grinds for local use, and also ships flour to the coast towns, where it competes with Manitoba flour.

This will conclude our letter on "Milling in Western Canada," and will show to what proportions the milling industry, which was inaugurated in Winnipeg in the fall of 1882, has already grown. To recapitulate, we find that there are now thirty-one roller flour mills in Western Canada, (that is, the country west of Lake Superior), including the three mills, one each at Oak Lake, McGregor and Keewatin, now well toward completion. Of these, twenty-two are located within the Province of Manitoba; seven in the Territory of Assiniboia; one in Saskatchewan Territory, and one in British Columbia. This great development which the milling industry has undergone within the short space of about five years, certainly argues well for the future, and at once places flour milling at the head of the manufacturing industries of Western Canada.

A BAND MILL'S WORK.

HERE'S a straw in favor of the band mill. R. L. McCormick, the secretary and manager of the North Wisconsin Lumber Company, of Hayward, is responsible for it. In 1886 their mill was without a band saw. The logs put through their mills scaled 29,805,000 of about five to a thousand. The lumber scale was 32,220,000 feet, or an over-run of 2,445,000 feet. During the past season the logs cut in their mill scaled 29,065,000 feet, and the logs ran about six to the thousand. The board measurement of the product of these was 35,300,000, but in 1887 about 6,000,000 less shingles were made than in 1886. Mr. McCormick estimates these as equivalent to a million feet of lumber. This million in any event no more than offsets the excess of raw material used in 1886 over that used in 1887, and on that theory Mr. McCormick has practically 3,050,000 feet more of lumber, which he credits to the use of the band mill. He estimates the class of lumber got by the band mill to be worth \$15 a thousand, and at that rate there is the nice little item of \$45,750 to the credit of the introduction of the band saw. That is what he got for

what might have been sawdust. Mr. McCormick figures it a little differently. The over-run in 1886 was 2,445,000 feet. The over-run in 1887 with the band mill was 6,245,000 feet, board measure. Deducting a million for the reduction in the amount of shingles cut and we have 5,235,000, or an excess during 1887 over that of 1886 of 2,790,000 feet. If Mr. McCormick's estimate that this lumber is worth \$15 a thousand is correct, there is the nice little item of \$42,850 to the credit of the band mill and profit.

THE LATEST MILLING IMPROVEMENT IN PESTH.

FOR some weeks past rumours have been heard that a new milling process was shortly coming to the front which would effect an entire revolution in the present system of making flour. Advices to hand this week from Pesth give some details of this process, from which it will be seen that it is an old thing in a new disguise. For years past it has been assumed that if a perfect wheat decorticator could be devised, the manufacture of flour would be so simplified that the cost of manufacture would be largely reduced, and the percentage of white flour largely increased. This new process is, in short a combination of a decorticator and a new sifter dressing machine, on a rotary principle. In Pappenheim's *Austro-Hungarian Miller* we are informed that the effect of the improvement is a better coloured flour and more of it, and that high grinding, as practised in Hungary, will, by its means, be capable of being made entirely automatic. In the judgment of trustworthy and capable millers, therefore, the improvements in question will probably lead to a revolution in milling. With reference to the decorticator, we have already partly described the "Till" and "Wimmer" machines, with each of which Messrs. Ganz & Co., of Buda Pesth, have experimented, the result being the perfected machine in question. For "patent" reasons a detailed description is not given. The sifter dressing machine, which is the invention of Mr. Haggemacher, of Pesth, and which has already been patented in the U.K., is perhaps the greatest novelty. Mr. Pappenheim describes it as like a box, completely closed, and hung up on the ceiling; it contains two to three sieves, and has an ingenious arrangement for spreading the material over the sieves; the movement is described as being like that of a hand sieve. The result, we are told, is very rapid and clean sifting, so that no re-dressing is required; very little skill is required for the sieves, and there is consequently very little wear and tear. This is difficult to understand, for if a large quantity of any material is passed through a sieve, the smaller the silk surface the greater must be the comparative wear and tear. In mills where this system of dressing is used, the effect is curious, the floors being empty of machines, which are all, so to say, hung up on the ceiling. In connection with this dresser a new purifier, also Haggemacher's patent, is used. Such, then, is the latest reform in milling in Buda Pesth, where, although it has not yet made much progress, it is thought by capable men as likely to prove the system of the future. It is, however, not likely to revolutionise milling in the U.K., as now practised; the conditions are entirely different between the two countries. The choice of wheat is quite different, in the first place; and, in the second place, the Pesth millers mill primarily for the export trade; so that if they can produce more white flour, say, above No. 4 grade, and at a less cost of manufacture, they will be better able to compete with American flour in England, which, after all, is probably the only reform intended in this new system. The lower and darker qualities of flour always sell well locally in Hungary, but would be of no use to an English miller, whose requirements are that the low grade should be reduced in quantity, and the bakers', or "straight," flour increased in both quantity and quality, which the decorticator system is not likely to do. We believe that a leading English milling engineer has lately examined this new system, with a view of introducing it into the U.K., but it is not likely to be done.—*Millers' Gazette*.

One of the most valuable suggestions we have heard recently, says the *Northwestern Miller*, is that of a Wisconsin miller, who urges that head millers should have a regular vacation, at least once a year, a part of which should be devoted to an inspection of the best mills in the country. Their expenses while engaged in this work would of course be borne by their employers. We believe that money thus spent will yield larger and better returns than the laying out of an equal amount in any other direction. No head miller knows it all, and there are none who cannot receive as well as give valuable pointers. The mills of the country are very accessible and there are few head millers who are not willing to entertain visiting brethren and interest them with technical matters. This being the case, the general adoption of the policy of sending head millers out on tours of observation would be a wise move. We are willing to guarantee that millers will find it profitable and satisfactory in more ways than one.



PUBLISHED MONTHLY,

BY

CHAS. H. MORTIMER,

Office, 31 King Street West,

TORONTO, - - ONTARIO.

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The DOMINION MECHANICAL AND MILLING NEWS will be mailed to subscribers in the Dominion, or in the United States, post free, for \$1.00 per annum, 50 cents for six months. Subscriptions must be paid strictly in advance.

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EDITOR'S ANNOUNCEMENTS.

Correspondence is invited upon all topics pertinent to the mechanical and milling industries.

This paper is in no manner identified with, or controlled by, any manufacturing or mill-furnishing business, nor will a bestowal or refusal of patronage influence its course in any degree. It seeks recognition and support from all who are interested in the material advancement of the Dominion as a manufacturing country, and will aim to faithfully record this advancement month by month.

Readers of the "MECHANICAL AND MILLING NEWS" will confer a favor upon the publisher and derive material benefit themselves by mentioning this paper when opening correspondence with advertisers. Drop us a postal card when you have written to an advertiser, give us his name, and then we will put you in the way of getting the benefit. Don't forget this.

AN Act has been passed by the Dominion Parliament which it is expected will put a stop to the stock-gambling establishments known as bucket shops. This statute has been framed none too soon—in fact scarcely soon enough to save the business community from loss on account of bucket shop speculations.

WHILE considerable fall wheat in Ontario is reported to have been winter killed, the prospects of a fair crop are said to be much better than in the wheat-growing districts of the United States. The business community in Canada suffered to no little extent from the short crop of last year, and at least a fair average yield is required this year to enable manufacturers and traders to recover lost ground.

THE month just closed was marked by an unusual number of mill fires in different parts of Canada, and the loss occasioned thereby was very heavy. Statistics prove that more fires are extinguished by pails of water than by any other method. A conclusion based upon an inspection of many mills and factories is, that water and pails are in very few instances kept on hand in a condition to be of service in case of fire.

WE are sure that every Canadian will await with much interest the report of the Commission which has been appointed by the Ontario Government to enquire into the mineral resources of the Province. We feel that the result of the Commission's labors will prove a surprise to many, and will lead to steps being taken to develop the mineral wealth which we believe will be shown to exist in abundance in many districts throughout Ontario.

THE Toronto Mail states that "The great and only Geo. Francis Train has decided to leave New Brunswick and return to New York. He threatens to deliver a series of lectures on the "Collapse of Canada." We are afraid that Mr. Train's mission will not prove a success, in view of the fact that the subject he proposes to discuss has already been worn threadbare by our esteemed and highly patriotic contemporaries, the

Toronto Mail and Globe. Our American consine can't be expected to pay for what they have been getting gratis.

THERE are hundreds of instances throughout Canada of men who own and operate both flour and saw mills. In isolated towns and villages especially these two lines of manufacture are peculiarly well suited to work together. The MECHANICAL AND MILLING NEWS gives the latest and most reliable information relating to the successful conduct of both flour and saw mills, and is therefore naturally regarded as being of particular value to persons engaged in both of these industries.

OUR enterprising contemporary, the *Northwestern Miller*, lately printed in italics a paragraph stating that its pages were protected by copyright, and that proper credit must be given to it by journals making use of information contained therein. This does not prevent the *Northwestern Miller* from appropriating *holus bolus* a column or more of Canadian news from the last number of this journal, without a line of credit. We don't care particularly about the matter, but mention it simply to show the peculiar consistency which marks the conduct of some people.

WE are always pleased to receive from subscribers and readers of this journal information suitable for its columns. In every instance, however, we require to have in our possession the name of the author, not for publication unless desired, but as an evidence of good faith. We occasionally receive communications unaccompanied by any name, and in all such cases are reluctantly compelled to consign them to the waste basket. Our readers will please make a note of the above, and if they wish to see their contributions in print, they must not forget to send their names.

IT is well that the Minister of Inland Revenue has been put in possession of all the arguments for and against the desirability of changing the present standards of grain. With the arguments before him, he will have ample time before next season's crop is ready for market to give the question the full consideration which its importance demands, and it is hoped that the wisdom of whatever action he may see fit to take will commend itself to a majority of the persons interested. It is very desirable that the shippers of the Northwest and the buyers of the east should work harmoniously together. The differences of opinion regarding proper standards must result in unsettling trade, and cause great annoyance to grain handlers. Any changes which may be made this year should be so well considered that the standards should remain as fixed for years to come.

A COMMITTEE of the Senate and the saw mill owners on the Chaudiere are discussing ways and means of disposing of the sawdust which at present obstructs and pollutes the Ottawa River. The mill owners object to burning the saw dust, on the ground that it would render their property, and indeed the entire city very liable to destruction by fire, besides increasing the cost of insurance. It ought not to be a difficult matter in these days to discover a method of utilizing sawdust, and of making money out of it. There is no reason why it might not be pressed, dried and sold at a profit as fuel to the residents of our cities. The poorer classes especially would welcome anything which could be substituted for coal at a cheaper price. If some enterprising individual at Ottawa would form a company to convert the sawdust from these large mills into fuel, he would probably not need to go outside the city of Ottawa to find a profitable market for the greater portion of it.

According to a recent cable dispatch from Liverpool, England, 2,000 emigrants sailed from Great Britain in one day for Canada, most of them intending to go to Manitoba and Assiniboia. It is not pleasant to speculate on the probable disappointment of many of these emigrants who go to north-western Canada. Doubtless they will follow the example of those who have gone before them to the same province. When they find life there too slow and unendurable, they will move to the United States, where there are better chances for advancement.—*Milling World*.

Hardly, friend, unless they should have been so unfortunate as not to have heard of the blizzards which during the last few months made life in Dakota and New York so exceedingly pleasant (?) you know. The people of Manitoba may go a little slower than those of the Western States, but it should not be forgotten that "fast" living does not as a rule secure the greatest comfort or happiness. We are able to offer the immigrant to the Northwest, the most productive soil in the world, immunity from floods and tornadoes, and just laws properly administered. We cannot imagine what more he should require, nor do we believe that in the States he could secure privileges as great.

IT is very necessary that the Dominion Government should take measures to check, or, if possible, to stop entirely the tide of pauper immigration which seems to have set in towards the Dominion. This is a big country, and full of opportunities for the honest, thrifty immigrant, who knows how and is willing to work, and who is possessed of a few hundred dollars on his arrival here; but there is no room for those who have all their lives been accustomed to depend for their existence on public charity. The question of what to do with the large pauper population in England, and how to get rid of the expense of providing for its necessities, is one which the British Government and public bodies are much exercised with, and which for some years past they have been trying to solve. The plan of paying the passage of these people to Canada, and thus shifting the burden of their maintenance from British to Canadian shoulders, seems to have been decided upon as the easiest way out of the difficulty. When a similar policy was pursued towards the United States, the Government of that country at once adopted restrictive measures, and paupers arriving at New York were not allowed to land, but were shipped back to Europe. This is the course that our Government should adopt. A tax of \$50 has been imposed on every Chinaman who seeks to reside in this country, and yet we venture to say that Chinese immigration is preferable to pauper immigration from Great Britain. Whatever fault may be found with the Chinese mode of life, they are at least self-sustaining, and never become a burden on public charity. Canada wants immigrants, but they must be of a class that will be able to do their share in the development of the agricultural, mineral and other resources of the country, and contribute their fair proportion to the public exchequer.

IN these columns recently comment was made on the case of a miller who bought a quantity of grain from a farmer, and was afterwards compelled to pay for it a second time by parties who held a mortgage on the wheat before it was cut. A somewhat similar case of hardship to an honest buyer is related by the *Winnipeg Commercial*, from which we quote as follows:—"The following is a copy of a notice recently served upon a Winnipeg citizen:—"I have the honor to inform you that the following timber located on lot —, supposed to belong to you, has been seized on behalf of the crown, namely, 3,000 cedar and tamarac fence posts. Any interference with the same until you produce proof to my satisfaction that it was taken from lands on which the Government has no claim, will subject you to the penalties provided by the Dominion Lands Act, respecting cutting timber without authority. Unless this proof be furnished within thirty days, or dues, amounting to 2 cents each be paid, the timber will be disposed of according to law." The posts referred to were purchased from different persons and at different times, on the Winnipeg market, and piled up on a vacant lot, where an eagle-eyed inspector spied and seized them. Now the owner is obliged to furnish proof that the Government has no claim on the timber, or failing in this to pay \$60 dues. It will be noticed that the burden of furnishing proof rests with the owner of the posts. This is a most outrageous proceeding, and one calculated to cause innocent persons any amount of inconvenience and loss. Though there may be no reason to believe that the timber was cut unlawfully, yet under this iniquitous act an over zealous official may step in and seize and sell another's property. In many cases the purchaser of wood upon the market would not be aware of the name and address of the party from whom he had bought, and in this case would be obliged to pay the dues or have his goods sold out of his hand. These timber regulations are certainly very unjust and capable of perpetrating much abuse.

WHAT is to be done when doctors disagree? Mr. H. H. Cook, M. P., delivered a lengthy speech in the Dominion Parliament recently, in which he argued that unrestricted reciprocity with the United States would put millions of dollars in the pockets of Canadian lumbermen. On the other hand, the member for Ottawa, Mr. W. G. Perley, an equally good authority on all matters relating to the lumber interests, spoke strongly against unrestricted reciprocity from a lumberman's standpoint. On the question of who pays the duty on lumber exported to the United States, he spoke from experience as follows: "Dealers in lumber and manufacturers in the United States, without any exception, contend that they pay the duty. They come here and buy lumber free on board and pay the duty on it. I do not intend to argue the question, but I will state my experience in the application of the treaty of 1854, and leave the hon. members to draw their own conclusion

as to which contention is right. Notice for the abrogation of the treaty of 1854 was given in 1864, with a duty of 20 per cent. imposed on pine lumber. At that time my firm was engaged in the sawing of lumber, and at the time this resolution was introduced my impression was that we did not experience any difference in the price of our lumber from the imposition of that duty. But to verify my impression I had an examination made on the books of my firm, and I found that from 1864 to 1867 there was no perceptible change in the price of our products. If anything the price increased in the latter year to some extent. But this instance goes to show conclusively that at that time we certainly did not pay the duty that was imposed on lumber by the United States." One thing appears to be certain, namely, that the unrestricted reciprocity idea is fast losing whatever popularity it might once have enjoyed. Lord Lansdowne's impartial condemnation of it in his farewell address at Ottawa the other day must commend itself to all thoughtful minds, and will do much to hasten the death of the agitation, an event which the reported dissolution of the Commercial Union Club in this city would seem to indicate is not far distant.

PERSONS who feel friendly to this journal can do it a service by examining its advertising columns, and whenever they see anything of interest, by mentioning it when they communicate with the advertisers.

THE *Timberman* has only seen one advantage in the free introduction of Canadian lumber to American markets, and that was confined to the economizing of our own forests.—Chicago *Timberman*. And is no advantage likely to accrue to Canada from economizing her forests?

WE take pleasure in being able to say a good word for the hand grenade. A fire at Fergus, Ont., the other day, is reported to have been extinguished by means of hand grenades. This should not prevent manufacturers and others who are risking the safety of their premises on grenades, from occasionally making a test of their efficiency.

THE city of Buffalo is to have an International Fair and Exposition on an extensive scale from the 4th to the 14th of September next. The estimated cost of the Exposition building is half a million dollars. An American contemporary states that "the Canadian exhibits will be the most extensive ever shown in America. The circuit of Canadian fairs has been so arranged as to accommodate the dates of the Buffalo Exposition, and it is expected to have nearly all of the exhibits of the Toronto exposition, which opens when the Buffalo fair closes. The management is also already assured of several valuable exhibits." Unless the management of the Toronto Exhibition have decided to fix the date of opening a fortnight later than usual, the Toronto Fair will take place simultaneously with the one in Buffalo, and this would make it impossible that nearly all the exhibits at the Toronto Exhibition should previously be shown at Buffalo. We trust, however, that if any Canadian exhibit is made at Buffalo, it will be of a character creditable to the Dominion.

THE Indiana Association of millers has been holding a convention at Indianapolis, where the members discussed such important subjects as the following: "Small Millers and the Export Trade," "Uniform System of Grading," "Mill Bookkeeping," "Cash vs. Credit in Sale of Flour," "Mill Mutual Insurance," "Steam Power for Flouring Mills," "The Exchange System." We have yet to hear of a convention of Canadian millers for the consideration of questions of like importance to the successful conduct of their business. It is not improbable that if our millers would hold a few such meetings with the object of receiving and imparting information, they might discover ways and means to extract larger profits out of the business. We have seen enough of the milling methods in vogue in some Canadian mills to warrant the conclusion that they could be rendered more profitable by systematic, intelligent, careful management. We invite opinions on the subject of a Canadian millers' convention.

WE note with pleasure that at an enthusiastic meeting held in Kingston a few days ago, it was decided to attempt the establishment of a school of practical science and agriculture. The projectors of the undertaking state that the school it is proposed to found will not make skilled mechanics of those who attend it—it is not proposed to do so—but it will give their

education a practical trend; it will give them an understanding of the nature of woods and metals and their properties, and an expertness with tools which will insure them a rapid promotion in the workshops; it will contribute to their expertness, and secure for them, as journeymen, a remuneration befitting their efficiency. They further state their belief that the need of the hour is the spread of practical information, such information as can be obtained only in a technical hall. It was remarked as a lamentable fact that the education given in the public schools was not practical enough. It tended to the professions; something was needed to train young men for other callings. We hope that success will crown this laudable undertaking, and that the youth of Canada will no longer require to go beyond the bounds of their own country to obtain the technical knowledge necessary to fit them for success in mechanical and industrial pursuits.

THE Parliamentary Committee, of which Mr. N. Clarke Wallace, M. P., is chairman, appointed to take evidence regarding the operations of trade combines, has presented its report. Sixty-three witnesses testified before the Committee concerning the doings of the combines in sugar and groceries, coal, biscuits and confectionery, match cases, barbed wire, binder twine, stoves, coffins and undertakers' supplies, oatmeal, eggs, barley and fire insurance. The conclusion arrived at is, that while some of the combines, as for instance that of the iron founders, have not worked injury to consumers, the general tendency of such organizations is to the public disadvantage, and that therefore they should be suppressed. With this object a Bill has been introduced into Parliament by the chairman of the Committee, Mr. Wallace. We believe this Committee has performed a most necessary work, and one for which it is entitled to the thanks of a large majority of the people. It is well that these combines should be regulated or suppressed thus early in their history, before they have become well established, and secured a hold which it would be much more difficult to loose. The policy of protection to home industries which we have adopted for Canada was never intended to give a few large concerns a monopoly of the Canadian market. It was designed rather to promote industrial enterprise and industrial competition. It was generally admitted and understood that for a time the price of certain manufactured articles might be slightly increased, but growing competition was relied on to remedy this. The object of these combines is to destroy competition, and to make use of the protection afforded by the tariff to exact from consumers undue profits. Under such a system the small manufacturer has no chance whatever. Those who engineered these combines were pursuing a short-sighted policy so far as their own interests were concerned. It should have been obvious to them that the oppressive operations of such monopolies would result in a demand for the removal of the protection which had been thus abused. We are not in favor of the combine idea as a remedy for overproduction. We would rather say, let there be competition, under equal conditions, and let the fittest survive. If a man is foolish enough to invest his money and embark in a business which he can easily see is already overdone, the fault is his own. When it is apparent that the market for a certain line of goods is fully supplied, let manufacturers refrain from starting new establishments to add to the production in that line, instead of going into business and being paid out of the exorbitant profits of combines to let their mills or factories stand idle. It is in the interest of the public, and eventually of all parties concerned, that the combines should be broken up.

A NEW REVOLUTION.

SHORT system development puts a different aspect upon the buhr milling question. There is not the excuse for buhr mills that there has been in the past. Milling can be done by rolls for the buhr milling system. Rapid reduction by rolls, say in two or three breaks, means about the same thing as reduction by millstones so far as the expense of the plant is concerned. Two or three reductions will make a better yield, and, of course, better flour than will one reduction by buhrs followed by the grinding process by bran rolls, and it is no more expensive as to the cost of the plant. Thus it is that we say that there is not the excuse for buhr milling that there was in the past, and we venture to say that within a very short time the remnant of buhr mills will have to give place to the short milling by rolls. The short system does not make any larger proportion of middlings when carried out in a very short way than does medium low grinding by buhrs. The same purifier outfit will do the work, and about the same number of rolls are required. Thus it is that it would be folly to continue

milling by buhrs after competition dictates that it should be done by the short system. Now the question is when will, or when does it dictate a thing of this kind. A miller can tell by feeling his own pulse, or rather his pocket-book—his business pulse. Whenever his neighbors gain on him for any reason he wants to look for the cause. If it is because of a change in milling that will show itself. No one need put in a short system simply because it is a short system, or because it is a roller system. It may go in only as a matter of necessity. The cost of putting in a roller system has been prohibitory in a good many instances, and has kept a good many millers from doing what they felt was a necessity. Now the time comes when there is a substitute. Many who have been restrained will take occasion to put in the roll for various reasons. Possibly their plant has run down, or their trade is buying flour from markets at a distance, or they wish to spread out. As soon as one mill in the neighborhood makes a change it becomes a necessity for the others to do the same thing. On general principles millers have done a great many foolish things in a business way. They have made a change for the sake of a change without being reasonably certain of a benefit. They have wasted millions of money on thoughtless experimenting. They were so much afraid that their neighbors would get ahead of them that they made changes on general principles, and for that reason for a long time milling was stagnant. We do not aim to say that the short mills of the kind that we speak of will compete with the more fully equipped roller mills. What we do say is that it is a great improvement on the old buhr system, and is little more expensive in the matter of the plant as carried out in some instances.—*The Millstone*.

Correspondents' Opinions.

This department is set apart for the free use of subscribers in asking or answering questions, expressing opinions, or relating bits of shop practice or experience. The editor hopes to see it liberally employed, and proposes to enlarge it to any necessary extent to accommodate communications.

DISPOSAL OF SAW MILL REFUSE.

NEW WESTMINSTER, B. C., April 25, '88.

Editor Mechanical and Milling News:

SIR,—Could you or any of your readers give us a good plan of a furnace for consuming sawdust, planer shavings and other mill refuse? We built one last winter about 6 feet long, 10 feet wide and about 12 feet high above the grate bars, arched over with red brick and lined around the sides with fire brick, and with a smoke stack 33 inches in diameter and 31 feet high on top, but the heat was too great and we had to take it partly down. The brick in the roof hung like icicles, and the stack would be red to the top. We would like a furnace that would to a great extent consume its own sparks or cinders, or at least kill them. Our lumber is principally Douglas fir, which is more pitchy than your eastern pine. We cut about 20 M. per day, and run two planers, a sticker, a shingle machine and a lath machine. The sawdust from the twin circulars more than furnishes fuel for steam making—all the rest has to be destroyed. We would be much obliged for any information on this subject.

Yours truly,

BRUNETTE SAW MILL CO., (LTD.)

[The attention of our correspondents is directed to an article entitled "Saw Mill Refuse," from the pen of Mr. Gen. C. Robb, Inspector of Steam Boilers, Toronto, which appears in this paper. We trust the information therein may prove serviceable in helping to overcome the difficulties experienced by our correspondents in seeking to accomplish their object. Should any reader of this journal be able to give further information on the subject, he will confer a favor by forwarding the same to this journal for publication.—THE EDITOR.]

NEW MILL FOR NEEPAWA, MAN.

NEEPAWA, MAN., May 24th, 1888.

Editor Mechanical and Milling News:

SIR,—The Neepawa Milling Company is now incorporated. First meeting of directors was held yesterday, at which Robert Connell was elected president and Jonathan J. Hamilton managing director.

It is the intention of the company to call for tenders at next meeting, 3rd June, for the building of a 100 bbl. mill, building comfortable and machinery up to the times, guaranteed durability and quality and quantity of output, to be in operation this fall. The capital stock of the new company is \$30,000, in shares of \$20 each.

Yours truly,

JONATHAN J. HAMILTON.

POINTS FOR ENGINEERS.

If a gauge-glass breaks, turn off the water first, and then the steam, to avoid scalding yourself.

Don't buy oil or waste simply because it is very cheap; it will cost more than a good article in the end.

In cutting rubber for gasket, etc., have a dish of water handy, and keep wetting the knife-blade; it makes the work much easier.

Don't forget that there is no economy in employing a poor fireman. He can, and probably will, waste more coal than would pay the wages of a first-class hand.

An ordinary steam engine, having two cylinders, connected at right angles on the same shaft, consumes one-third more steam than a single cylinder engine, while developing only the same amount of power.

A fusible plug ought to be renewed every three months by removing the old metal and re-filling the case; and it should be scraped clean and bright at both ends every time the boiler is washed out, to keep it in good working order.

When you try a gauge cock, don't jerk it open suddenly, for if the water happens to be a trifle below the cock the sudden relief of pressure at that point may cause it to lift and flow out, deceiving you in regard to its height. Whereas, if you open it quietly, no lift will occur, and you ascertain surely whether there is water or steam at that level.

Always open steam stop-valves between boilers very gently, that they may heat and expand gradually. By suddenly turning on steam a stop-valve chest was burst, due to the expansive power of heat unequally applied. The same care is also recommended when shutting off stop valves. A fearful explosion once occurred by shutting a communicating stop-valve too suddenly—due to the recoil.

In order to obtain the driest possible steam from a boiler, there should be an internal perforated pipe (dry pipe, so called) fixed near the top of the boiler, and suitably conducted to the steam pipe. The perforations in this pipe should be from one-quarter to one-half greater in area than that of the steam pipe. Domes are of no use as steam driers.



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Manufacturers of all kinds of files and rasps. All descriptions of re-cutting done promptly. Terms and discounts given on application. Address GALT, ONT.

PATENT NO. 24,369, Dated June 21st, 1886, for the manufacture of Moulding and Polishing, are prepared to grant licenses in Canada, or to negotiate for the sale of the Patent HENRY GRIST, Patent Agent. OTTAWA.

MACHINERY FOR SALE.

PETRIE'S list of saw mill and general woodworking machinery. Send for descriptive lists giving full particulars. Address, H. W. PETRIE, Brantford.

- ONE saw mill with large timber limit. ONE block mill, Waterous Engine Co.'s make. ONE new plantation saw mill, suited for 12 to 16 h. p. engine. ONE water power saw mill. ONE Automatic sawing machine. ONE new gang lath mill. ONE Waterous self-feed lath mill with bolter. TWO stave cutters, and heading turners. ONE Goldie self-acting shingle machine, one Waterous, one Green Brook and one Eureka, all first-class mills. TWO Doherty hand swing and two upright swing shingle machines. EIGHT wheel jointers by different makers. FOUR drag saws. SIX planers and matchers, heavy and light, by different makers. TWELVE surface and pony planers. SIX moulders, 1, 3 and 4 side. FOUR tenoring machines, single and double cope. SEVERAL blind slat machines. EIGHT band saw machines, from \$35 up. SHAPERS, morticers, scroll saws, boring machines, sand paperers, lathes, mitring machines, saw tables, from one to twelve of each. THREE spoke lathes by different makers. ONE Automatic handle lathe. ONE axe handle lathe. ONE wood bowl machine. TWO set of hoop machines. ONE set of spoke machines, Fay make, Cincinnati.

JUST arrived—a large shipment of woodworking machinery from Galt with latest improvements. Orders filled promptly at manufacturers' prices. Full particulars and terms of any of above machinery on application. Address H. W. PETRIE, Brantford.

To Millers, Manufacturers, and Steam Users—Write



- BECKETT ENGINE CO., HAMILTON, for automatic engines. BECKETT ENGINE CO., HAMILTON, for marine and stationary boilers. BECKETT ENGINE CO., HAMILTON, for portable engines and boilers. BECKETT ENGINE CO., HAMILTON, for saw mill machinery. BECKETT ENGINE CO., HAMILTON, for saw mill engines. BECKETT ENGINE CO., HAMILTON, for shafting and pulleys. BECKETT ENGINE CO., HAMILTON, for patent couplings and hangers. BECKETT ENGINE CO., HAMILTON, for mining machinery. BECKETT ENGINE CO., HAMILTON, for repaired boilers. BECKETT ENGINE CO., HAMILTON, for repaired engines. BECKETT ENGINE CO. test all their boilers to three times the working pressure, before leaving the works.

THEIR BOILERS AND ENGINES are specially built with a view to safety, economy and efficiency; get our quotations before deciding your purchase, by writing BECKETT ENGINE CO., Hamilton, Ont.

ECONOMY—TO STEAM USERS—great saving in fuel; a steady and uniform steam supply and a positive increase of steam capacity are effected by using the U. S. Rocking Grate Bar Co.'s grates, manufactured under patent by Beckett Engine Co., Hamilton, Ont.; from twenty to twenty-five per cent. saving according to testimon-

als; in use in over one hundred and forty thousand horse-power of steam boilers; two boilers with these grates do the work of three with the fixed grates. Full particulars from BECKETT ENGINE CO., Hamilton.

LUMBER PRICES.

Table with columns for CAR OR CARGO LOTS, listing various lumber types and prices. Includes items like 1 1/2 inch and thicker clear picks, Am. Ins., 1 1/2 inch and thicker, three uppers, Am. Ins., etc.

YARD QUOTATIONS.

Table listing yard quotations for various lumber types and prices. Includes items like Mill cull boards and scantling, Shipping cull boards, promiscuous widths, etc.

MONTREAL PRICES.

Table listing Montreal prices for various lumber types and prices. Includes items like Ash, 1 to 4 in., M., Birch, 1 to 4 in., M., Basswood, etc.

ST. JOHN, N. B.

Table listing St. John, N.B. prices for various lumber types and prices. Includes items like Spruce deals, Bay Fundy Mills, Spruce deals, City Mills, etc.

NEW YORK PRICES.

Table listing New York prices for various lumber types and prices. Includes items like Uppers, Spruce deals, Bay Fundy Mills, Spruce deals, City Mills, etc.

Table listing SHINGLES prices for various types and sizes. Includes items like Pine, 16 in., extra, 18 in. extra, 18 in. clear butts, etc.

Table listing HEMLOCK prices for various types and sizes. Includes items like Timber, Joists, Boards, Lath, etc.

Table listing DRESSED LUMBER, CAR LOAD LOTS prices for various types and sizes. Includes items like No. 1 flooring, 3/4 in., No. 1 ceiling, 3/4 in., etc.

ALBANY, N. Y. PRICES

Table listing Albany, N.Y. prices for various lumber types and prices. Includes items like Shingles, shaved pine, 2d quality, Sawed, extra, etc.

HEMLOCK.

Table listing Hemlock prices for various types and sizes. Includes items like Boards, 10 in., each, Joist, 4x6, etc.

PINE.

Table listing Pine prices for various types and sizes. Includes items like 2 1/2 in. and up, good, 4ths, Selects, etc.

BUFFALO AND TONAWANDA PRICES.

Table listing Buffalo and Tonawanda prices for various lumber types and prices. Includes items like NORWAY PINE—ROUGH, No. 1, 1 and 1 1/2 in., etc.

WHITE PINE—ROUGH.

Table listing White Pine—Rough prices for various types and sizes. Includes items like Uppers, 1 and 1 1/2 in., 1 1/2 and 2 in., etc.

DRESSED LUMBER.

Table listing Dressed Lumber prices for various types and sizes. Includes items like No. 1, No. 2, No. 3, Base and Casing under 6 in., etc.

SHINGLES AND LATH.

Table listing Shingles and Lath prices for various types and sizes. Includes items like Shingles, 18 in., XXX, XX, X, etc.

USEFUL INFORMATION

Dromire has discovered that bronze is rendered malleable by adding to it from one-half to two per cent. of mercury.

MELTING WROUGHT IRON.—The temperature necessary to melt wrought iron lies between 4000° and 5000° F., and even at that tremendous heat wrought iron is only rendered fluid by the addition of a small amount of aluminum.

A Vienna engineer has just taken out a patent for a new smoke-abating process. By means of electricity he proposes to condense the solid part of the smoke as it arises from the coal, the carbon thus formed falling back into the furnace.

TO HARDEN COPPER.—Melt together and stir until thoroughly incorporated copper and from one to six per cent. of manganese oxide. The other ingredients for bronze and other alloys may then be added. The copper becomes homogeneous, harder and tougher.

The ancients were acquainted with seven metals which they supposed to possess certain mystic relationship with the planets, and were represented by the hieroglyphics by which the planets were known. Gold was called Sol or sun, silver, Luna or moon, iron, Mars; lead, Saturn, copper, Venus, tin, Jupiter, mercury, Mercury.

A WOODEN BAROMETER.—It is said that a very good and sensitive barometer may be made by gluing together strips of red cedar and seasoned pine. A strip of cedar about thirty inches long, 1½ inches wide and one-eighth of an inch thick is cut with the grain, and to one side of it must be glued strips of pine of equal thickness, with the grain running across that of the cedar. The combination is set on end and will, according to the state of the weather, be found to have bent over to one side or the other, and this may be determined on trial.

THE STRAIN UPON CAST IRON WHEN COOLING.—A general of the Russian army has been making a long series of delicate experiments to determine if possible the amount of stress and strain developed within cast iron during the process of cooling. The immediate bearing of his researches is upon the strength of large guns, and it has been found by him that the internal strain existing in cast iron, because of the necessarily unequal rapidity of cooling of the different parts, is even greater than has been supposed.

MUSTARD OIL IN LUBRICATION.—M. Thier, an engineer of Erfurt, Germany, after experimenting for months to find a lubricator which would prevent a welding together of iron surfaces upon which much and rapid friction is exercised, such as turbine wheels, has found that ordinary oil of mustard, mixed with small quantities of petroleum, fish oil or other similar fatty substances, answers the purpose in every respect and overcomes all the difficulties heretofore experienced with machinery where excessive friction disturbs the physical quality of the metal used.

For belt and leather grease the *German Car Builder* recommends the following mixture. Melt three parts common soap with one part palm oil and add to the mixture four parts ammonia soap (which is obtained by saturating oil soap with carbonate of ammonia) and 1½ parts of a tannin solution obtained by dissolving 16 parts tannic acid in four parts of water. The whole mixture is thoroughly mixed, and can be kept for a long time in closed stone jars. When this mixture is applied to the leather, care should be taken not to use too much of it, but just sufficient to saturate the leather.

TO PERFORATE GLASS.—In drilling glass, stick a piece of stiff clay or putty on the part where you wish to make the hole. Make a hole in the putty the size you want the hole, reaching to the glass of course. Into this hole pour a little molten lead, when, unless it is very thick glass, the piece will immediately drop out.

HANDY MIXTURE FOR A MACHINE SHOP.—It has been stated that soft soap, with half its weight in pearl ash, one ounce of mixture in about one gallon of boiling water, is found of great practical use in engineers' shops, in the drip pans used for turning long articles bright in wrought iron and steel. The effect of the mode of treatment is that the work, though constantly moist, does not rust, and bright nuts are immersed in it for days till wanted, retaining their polish.

The most powerful electro-magnet in the world has been constructed at Willet's Point by Major W. R. King, U. S. A., who placed two 15 inch columbads side by side connected at the breech by railroad rails lashed to the cascades. The muzzles were wound with about eight miles of insulate wire, and excited by a 30 h. p. dynamo. The breech connection and the armature were both too small and therefore the full power of the magnet was not developed, still to remove the armature required a pull of 20,600 lbs., and 1,280 lbs. was suspended from the muzzle of one gun. It was possible with a piece of iron in the hand to perceive the lines of force at a distance of five or six feet, and a neutral point was discovered in the axis of the bore in each gun at a distance of 7½ inches from the muzzle.

MAGNETISM OF METALS.—"Shelford Bidwell (Royal Society, March 14) is continuing his admirable researches on the changes produced by magnetism in the linear dimensions of the different magnetic metals," says Nature. "He finds that iron, which first expands with the magnetizing force, soon reaches a maximum point, whence it contracts until it attains its original length; but on still further increasing the magnetizing force it contracts until it apparently reaches a minimum point, beyond which his means have not enabled him to proceed. Bismuth appears to continually expand, nickel to continually contract, while cobalt contracts, reaches a minimum point and then expands, approaching its original length. Manganese steel was unaffected. His apparatus was so perfect and sensitive that he could read a variation of one hundred thousandth of a millimeter."

TO MAKE PLATINUM ADHERE TO GOLD.—Platinum can be made to adhere to gold by soldering in the following manner. A small quantity of fine or eighteen carat gold should be sweated into the surface of the platinum at nearly a white heat, so that the gold shall soak into the face of the platinum. Ordinary solder will then adhere firmly to the face obtained in this manner. Hard solder acts by partially fusing and combining with the surfaces to be joined, and platinum alone will not fuse or combine with any solder at a temperature anything like the fusing point of ordinary gold solder.

METALIZING WOOD.—A process by which wood is made to take on some of the characteristics of metal is being now turned to practical account in Germany. By this process, which has produced some remarkable results, the surface becomes so hard and smooth as to be susceptible of a high polish and may be treated with a burnisher of either glass or porcelain; the appearance of the wood being then in every respect that of polished metal, having, in fact, the semblance of a metallic mirror, but with this peculiar and advantageous difference, namely, that, unlike metal, it is unaffected by moisture. To reach this result the wood is steeped in a bath of caustic alkali for two or three days together, according to its degree of permeability, at a temperature of between 164 and 197 degrees Fahr. It is then placed in a second bath of hydrosulphate of calcium, to which a concentrated solution of sulphate is added, after some 24 or 36 hours. The third bath is one of acetate of lead, at a temperature of from 65 to 120 degrees Fahr., and in this latter the wood is allowed to remain from 30 to 50 hours. After being subjected to a thorough drying it is in a condition for being polished with lead, tin, or zinc, as may be desired, finishing the process with a burnisher, when the wood apparently becomes a piece of shining metal.

BRITISH GRAIN BUYERS IN MANITOBA.

WE take the following extracts from a lengthy letter written by one styling himself "Old Burr, of Winnipeg," and printed in the last number of the *London, (Eng.) Miller*, regarding the probable success of the *Miller's* proposal for the formation of British syndicates to buy wheat direct from Manitoba farmers for shipment to Europe, there to be ground into flour: "As a northwestern man I am gratified by the notice the *Miller* has of late been taking of the wheat products of the Northwest. As the case now stands it is pretty certain that England must be the main market for that, our staple product, for some time to come, and it is of prime importance that the relations between producer and consumer should be as direct and friendly as possible."

Concerning the permanence and reliability of the supply this writer says: "Of this there can be no doubt. South of the line of St. Paul, not above three crops of wheat can be taken from the rich virgin soil till the product becomes degenerate, and its cultivation decidedly unprofitable. The state of Kansas did not last year produce as much wheat as three Red River counties of Dakota, and the farmers of South Dakota itself are rapidly going out of wheat as an unprofitable crop. It may be put down as a certainty that before the end of the century the 46 parallel of north latitude will be the southern limit of profitable wheat raising, but north of that line the case is entirely different. The soil, climate and conditions are all admirably suited to the production of a very great and long sustained output of choice spring wheat at a low price. Assurance on this point is important, and I shall try to make it clear. I am satisfied that Egypt in her palmiest days did not, and could not, turn out such a crop of cereals as could at three years' notice be turned out from the valleys of the Red River and its affluents. In seven years the wheat crop of Dakota has leaped up from less than 3,000,000 bushels to 60,000,000 per annum, last year's good wheat crop of Manitoba, raised by a farming population of less than 25,000 leaves a surplus for export of 12,000,000 bushels. These results have been attained in the face of very great disadvantages. When the great "boom" of 1882 struck this section of country, wheat was worth close upon a dollar a bushel. It has since dropped to between 50 and 60 cents, and all the vicissitudes of frost, hail, drought, combined with the painful reaction that of necessity follows all periods of undue inflation, have done very much to check severely the enterprise of really good men, and drive feeble and unskilful amateurs entirely out of the running. And yet with the strong probability that prices of their staple products must still continue very low. I have never seen such a vigorous and hopeful movement going on in the Northwest as there is this season." The difficulties in the way of the success of the scheme are thus referred to: "I notice that some people have already been demonstrating the sure profits to be made by your buying direct from farmers here. The bait is tempting enough on paper. Let me quote on fact. High up in Dakota and Minnesota wheat last fall was making very low figures. In November the Northern Pacific ran a branch up to the Manitoba boundary, thus tapping the big wheat yield of the west side of the Red River, and at once the price of wheat rose from 5 to 10 cents a bushel over the whole country. Competition

from a new quarter had broken in upon the friendly group that were buying some of the best wheat on this continent at their own price. Minneapolis wants to be the hub of the flour world, and though she has been, in conjunction with railroad monopoly, making farming for these last few years a miserable business, she could not afford to let all that good wheat go out, by way of Duluth, to be ground by her rivals, and sufficiently high figures are offered to crowd the Duluth speculators out of the market. Duluth elevators are now more than one half empty, while Minneapolis holds a full hand of No. 1 hard. In addition to this thoroughly American move to crowd competitors out of the market, the Minneapolis millers own and control, in the new "Soo" road, the very cheapest route to the Eastern States to England; I might almost say to Canada, in spite of the important duty on flour. To drive all rivals out of the field, and then fix his own prices, is the favorite policy of the powerful American business man. The combination "ring" or "trust," that one day meets to regulate prices and the amount of output, and fix on the likeliest market in which to "slaughter" a surplus of make, will meet the next day, if the alarm call is given, to arrange for a determined onset upon any intruder who dares to poach upon their preserves. Any English syndicate for the purchase of Northwestern wheat would certainly have to face this style of opposition in some way. The chain of lakes is an easy mode of transit in summer, but winter is the main season for getting out wheat, as the farmer wants all his time in fall to thresh it and plough his stubbles for next spring's seeding. The roads are, as a rule, nothing but mud, and, even if so disposed, many a man could not haul a bushel to market till frost and snow made sleighing possible. In this direct and close connection with the wheat fields, as well as his command of a first-rate Eastern connection, the Minneapolis man has a clear lead of all rivals in the wheat market. If the facts are as I put them, it will require a good deal of English pluck to beard the lion in his den. For the six months wheat on the Canadian side of the boundary has been considerably cheaper than on the other. But for the failure of Ontario's last year's crops, it would perhaps have been still cheaper. Sent all rail, *via* Boston to England, it has cost one bushel to carry another there. It will always be expensive, this all-rail haul, and the only chance I can see for the English miller to buy with advantage direct from Manitoba is by storing over the winter at Port Arthur or Duluth, and thence by the cheapest water carriage to England during summer months. The rates from the prairie province to those two shipping points are sure to be pretty closely cut whenever real competition begins, as the Canadian Pacific Railway management will not lightly allow that part of its business to slip out of its hands. With first-rate elevator facilities at terminal points, with proper checks against mixing at half-way elevators, and with the control of plenty of cheap capital, it seems to me that in this way, as an opening, an English company, directed by men of practical aptitudes, and with no immoderate tendencies to spread-eagleism, could most prudently venture into the Northwestern market. They would have much less chance of being met by virulent and active opposition than if they directly encroached upon the field now held by the Minneapolis millers. A little experience in this more narrow field, if only for two seasons, would show how the venture was likely to succeed, and prepare its management for entering more confidently upon the wider field, should they see good to make the plunge. One other argument I would have advanced in favor of this tentative policy. Piles of money have already been wasted on big windbag schemes, usually controlled by men with very little sound knowledge of their field of operation, and whose main attraction for us pioneers was the lordly way in which they made ducks and drakes of other people's money. The "blooming Englishman," with his serene self-complacency, is to a certain section of our community a goodly prize, and welcomed accordingly, and if you are warned by the fate of your cash laid out on cattle companies, railroad schemes, and monster farms and land companies to "go a little slow" in the "woolly Northwest" till you have got the hang of the business, it will be perhaps all the better both yourselves and the honest men whose produce you wish to buy.

On a careful review of the whole situation I do not hesitate to say that in good hands and prudently set about, a company that could put up a good elevator and warehouse at Port Arthur would find a safe and fairly remunerative business opening there, and one likely to last for a long time to come. Those who want 20 per cent. profit on the business they propose to transact, should go to Tom Tidler's ground, or to southern California, where they can find any day all the investments require."

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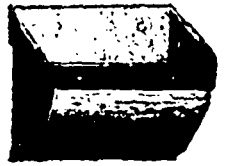
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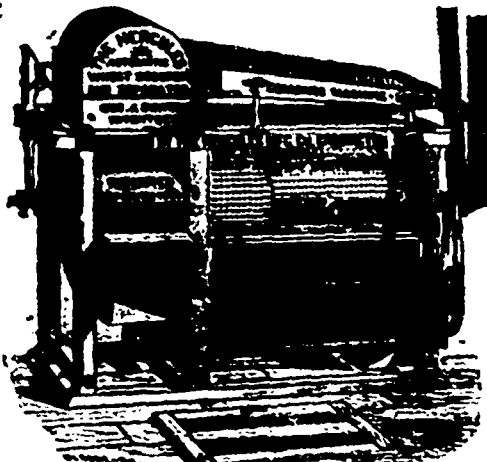
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The channel is being dredged leading to the Waubushene mill. Messrs. McLeod & Co. will operate the grist mill at High Bluff, Man.

The Montreal flour mills have a combined capacity of about 3,000 barrels per day.

Mr. P. Murphy's flour mill at Seaford, Ont., was burned at midnight on May 17th.

The mill at Birtle has been obliged to close down in consequence of the dam giving away.

A first-class steam grain elevator is to be erected at Berlin, Ont., in time for the new crop.

British India expects to have a surplus of 30,000,000 bushels of wheat to export this year.

The milling firm of McCaul, McNichol & Reilly, Regina, N. W. T., has been dissolved.

The erection of Law & Pearson's new elevator at Neepawa, Man., has been commenced.

Mr. J. H. Michie, late of Minneapolis, has leased and is operating a small mill near Guelph, Ont.

Marshall Hart's roller flour mill at Bloomfield, Ont., was burned a fortnight ago. Loss covered by insurance.

Mr. J. G. King, of Port Hope, has been appointed treasurer of the Keewatin Milling Co., on the Lake of the Woods.

It is estimated there are sufficient cargoes of grain at Fort William and in the Northwest for two hundred and fifty vessels.

Fire destroyed Helson's grist mill at Sebringville, Ont., recently, together with other adjacent property. The total loss is estimated at \$9,000.

The Regina, N. W. T., people are displeased because they were not asked to take part in the proposed conference to fix grain standards.

P. C. Pettungel, Manager of the International Grain and Stock Exchange at Glencoe, has been arrested on two charges of embezzlement.

The large dams at White's mills, near Aylmer, Ont., which were washed away, will be rebuilt immediately by Mr. James Finney, of St. Thomas.

Messrs. Snider & Wismer, millers, Doon, Ont., are offering to compromise at 8c., and T. & A. B. Snider, German mills, at 10c. on the dollar.

The people of Port Arthur regard that place as the greatest Canadian market of the future. There is certainly some ground for the belief.

The "International Grain and Stock Exchange," Toronto, closed its doors on the passing of the measure for suppressing bucket shops.

Mr. Purly, of Carberry, Man., has recently patented a middlings purifier and the invention is to be used in McCulloch & Co.'s mill at Rapid City.

The Alberta mills narrowly escaped destruction by a prairie fire recently. Indeed the report states that a small portion of the machinery was burned.

Mr. Geo. Hall is reported to have purchased Craig's interest in the Virden flour mills. It is said to be the intention to enlarge the capacity and erect an elevator.

The number of cars of wheat inspected at Winnipeg since the first of the year, aggregate 3,103, as compared with only 2,004 for the year ending 31st July, 1885.

In *Breadstreet's* statement of the total stock of wheat out of farmers' hands on May 1st, Manitoba, Fort William and Port Arthur is given 4,050,000 bushels.

A monthly visible supply statement designed to take in the grain stocks at over 900 points in the United States and Canada, has been inaugurated by *Breadstreet's*.

A reward of \$200 was offered for the discovery of the incendiary who fired the Marquette mills at Portage la Prairie, Man., and a man arrested on suspicion has confessed the crime.

At three o'clock on the morning of Sunday, May 30th, the Marquette flour mills at Portage la Prairie, Man., were destroyed by fire. An incendiary is supposed to have set fire to the mills.

The Port Arthur Board of Trade recommends that extra Manitoba hard wheat should comprise 75 per cent. of Red Tye, but the Winnipeg Board of Trade would have it contain only 85 per cent.

Messrs. Timewell & Sons, Winnipeg, Man., have prepared plans for the erection of a large grain elevator on the line of the Red River Valley Railway, at St. Jean Baptiste, for Mr. W. Martin.

Spink's flouring mill at Pickering, Ont., was entered by burglars on the night of May 13th. The safe was blown open and about fifty cents worth of coppers and the iron vault from inside the safe were carried away.

The new Hlytheswood roller mill, at Hlytheswood Station, on the Leamington & St. Clair Railway, and which had only been running a few days, was destroyed by fire recently. Loss about \$10,000; insurance \$5,000.

A Montreal paper asserts that a Toronto syndicate of grain buyers has secured from the C. P. R., a special freight rate from Winnipeg to the east which gives them an advantage of from 2 to 4 cents per 100 lbs. over local Manitoba shippers.

The St. Thomas mill belonging to Messrs. Campbell, Stevens & Co. is being remodelled on the three track system of grinding, and when completed will have a capacity of 450 barrels. The mill is expected to be in running order by the 1st of July.

The mill dam at Kettleby, Ont., the breaking away of which has caused frequent stoppage of the flour mill at that place, has at last been made tight, and the mill has resumed operations.

An advance in export as well as local flour markets caused a feeling of temporary satisfaction at least in milling circles during the last month. The hope it widely entertained that the more lively demand which is the cause of this advance in price may continue.

The annual statement of the affairs of the C. P. R. shows that the Company's grain elevators at Port William, Port Arthur, Owen Sound and Montreal, earned a satisfactory dividend, notwithstanding that they were largely used for the special purposes of the owners.

Superintendent Whyte, of the C. P. R., lately visited a number of large elevators in the Northwestern States, with a view of finding out all the latest improvements and incorporating them into the large new elevator which the company is about to build at Port William.

London Free Press: The old four-story frame mill south of the Batt House, Port Stanley, fell on Monday about 1 o'clock. It was one of the old landmarks, being built in 1843. It has not been occupied for the last twenty years. Lately it was owned by James Wegg.

Keewatin, Ont., gives promise of becoming the scene of extensive milling operations in the future. It is reported that the Lake of the Woods Milling Co., who are just completing the new 1300 barrel mill at that place, have decided to put up another one of large capacity.

Mr. Wm. Henderson's large flour mill at Iona Station, Ont., together with the grain warehouse adjoining, was totally destroyed by fire early on the morning of May 25th. Mr. Henderson's loss is estimated at \$10,000. The amount of insurance on the property has not been learned.

A fire on the 18th of May destroyed McInnes & Co.'s storehouse at Ingersoll, Ont. It contained 500 barrels of flour belonging to J. Cawthorpe, of Thamesford, on which there was no insurance. The building and scales were worth about \$1,000, and were insured for \$500.

The committee appointed to examine the basin of the McKenzie river, with a view to ascertaining its possibilities in relation to the proposed Columbia Valley and McKenzie river railway, report 316,000 square miles available for wheat and 407,000 square miles for barley raising in that region.

W. P. Christie's shingle mill at Severn Bridge, Ont., took fire on May 12th while all the employees except the foreman were away to dinner, and totally destroyed the building. The fire originated in the engine room. Mr. Christie has the framework ready for a new mill to replace the one destroyed.

Mr. M. D. Campbell, lately in charge of Wilson's mill at Glenora, Ont., has removed to Chatham, where he will operate the Holmes mill on his own account. Mr. Campbell is an energetic, progressive miller, and in his new undertaking we hope to see him achieve the success he deserves.

Mr. J. D. Saunty, proprietor of the North Branch Mills, London, Ont., has had a little legal difficulty with the Fishery Inspector through neglecting to keep the fishway in his dam in proper repair. He having agreed to comply with the fishery regulations, the difficulty has been settled.

At a meeting of the Cochrane Roller Mill Supply Company held at Escanaba, Mich., recently, Mr. V. E. Fuller, Hamilton, was elected president, and Mr. W. F. Cochrane, Dundas, Ont., vice-president of the Company. The largest stockholder is Hon. J. H. McDonald, Lieutenant-Governor of Michigan.

The *Winnipeg Commercial* says:—It has been decided to write C. S. Rider for G. T. Smith, Company, of Stratford, to the effect that the Brandon council is inclined to grant a reasonable bonus to anyone erecting a flouring mill in Brandon, and that the council requests further correspondence as to terms, etc.

Some Northwest grain dealers will make fortunes as a result of the recent advance in prices. The Ogilvie Co. are reported to have on hand considerably over a million bushels; McLean Bros., 600,000 bushels; McMillan & Co. and others, large amounts. These fortunate individuals will be able to sell at an advance of 15 to 20 cents per bushel.

About 9 p. m. on the 10th of May the new roller flour mill of J. J. Munns, of Hlytheswood, was discovered to be on fire. Owing to the progress the flames had made when discovered it was impossible to save the mill, and in thirty minutes it was reduced to ruins. The mill had only been in operation about three weeks and was doing a good trade. Loss about \$10,000, insured for \$5,000 in the Ont. Mutual, Huron and Middlesex, and Perth Mutual Companies.

The *London Free Press* says: Gideon Doupee and Alfred C. Brewer are partners in the milling business at Lucan, and of late a series of disagreements between them in regard to the management have resulted in Brewer's taking possession of the books, which he will not give up, while Doupee has sworn out a warrant against his partner, whom he charges with embezzlement, the sum being \$250. A later report states that the partners have agreed to settle the dispute by arbitration.

The *Winnipeg Sun* remarks that it is a great pity the ice does not leave Port Arthur harbor a couple of weeks sooner in the spring. The spectacle of a large fleet of vessels debarred by the ice from entering the harbor would not be witnessed, as at present. This states of affairs keeps back the flow of commerce. Millions of bushels of wheat are awaiting shipment from the head of Lake Superior. A small expenditure on the part of the Dominion government in providing a powerful ice-breaking vessel for Port Arthur and other similar harbors might remedy the evil.

At an early hour on the morning of May 18th, Hunt's flour mill at London, Ont., was discovered to be on fire. The flames had gained considerable hold on the building when the fire brigade reached it, and the bursting of a hose pipe caused further delay, and made it impossible for the firemen, when they did get to work, to save any portion of the building or its contents. The building was reduced to a heap of ruins, and the machinery, some of which

was new and had only been in operation a few days, was rendered entirely useless. The loss is estimated at \$8,000, which is covered by insurance. The origin of the fire has not been discovered.

The exports of grain from Manitoba to the 1st of May are given as follows: Wheat, 6,300,000 bus.; wheat in flour, 750,000 bus.; barley, 352,000 bus.; oats and oatmeal, 700,200 bus.; total export to date, 8,300,000 bus.; estimated yet to arrive from Manitoba, 2,000,000 bus. wheat and 200,000 bus. coarse grains; making the total of the Manitoba grain export this season, when complete, 10,500,000 bus. grain, exclusive of potatoes, flax seed and its products. The amount of wheat now in store at Port Arthur is 2,691,165 bus.

The *Hamilton Spectator* says:—The patents for the new improvement in roller mills, owned by W. F. Cochrane and Valancy E. Fuller, have been capitalized in Escanaba, Mich., for \$400,000, one half of which sum goes to Mr. Cochrane and Mr. Fuller. At a meeting of the company held at Escanaba this week, Messrs. Cochrane and Fuller were both elected to the board of directors, and subsequently Mr. Fuller was elected president, and Mr. Cochrane vice-president of the company. The largest stockholder is Hon. J. H. McDonald, a millionaire of Escanaba, who is also Lieutenant-Governor of the State of Michigan.

The kiln has, from time immemorial, been a conspicuous auxiliary to the oatmeal mill, says a writer in the *London Millers' Gazette*. When in operation drying the smell of the smoke from the kiln was noticeable long before you reached the mill, and those who had any experience in milling had no difficulty in deciding two things, (1), the quality of the oats, and (2), the working of the kiln. In dry seasons, early harvests and fine crops the drying of the oats was a simple affair, comparatively speaking; but when the reverse of these conditions was experienced it was otherwise, the task of the miller being trying in the extreme in order to produce a passable sack of meal. It follows that between good and bad seasons there is a considerable diversity in the quality of oatmeal; more so, perhaps, than in wheaten flour, which as a rule is not injured the kiln-drying in wheat.

A deputation of grain dealers comprising Messrs. D. J. McLean, of Winnipeg; Campbell, of Brandon; Smith, of Regina; Gibb, grain inspector, Port Arthur; A. J. McLean, of the Montreal Board of Trade; H. Labelle, inspector in Montreal, and Chapman and Morgan, of the Boards of Trade of Toronto and Hamilton respectively, had an interview with the Minister of Inland Revenue on May 13th regarding the classifications of grain. The Northwest dealers asked that the standard for extra hard wheat should be lowered from 100 per cent. to 85; that No. 1 hard should be reduced from 86 to 66½ per cent., and No. 2 hard likewise. Ontario and Quebec dealers objected to frequent changes in the classification to suit as they said, the variable quality of Manitoba grain. It was suggested to the Minister that a grade of white fls should be established with a percentage varying according to different recommendations from 75 to 95 per cent., that No. 3 northern grade be abolished, and that a distinct grade of barley for the North-West product, to be known as Manitoba barley be also established. The Minister informed the deputation that he would give the matter careful consideration, and would endeavor to change the act in a way that would be satisfactory to all parties.

The Manitoba members at Ottawa have presented a memorial asking the government to abolish the privilege of grinding wheat in bond. They represented that hard northwestern wheat was necessary for mixing with the soft varieties grown in Ontario. Under the bonding system, says the *Winnipeg Commercial*, a bond covering a quantity of wheat brought in is cancelled by the export of an equal quantity of flour. In other words one hundred thousand pounds of flour exported cancels a bond for one hundred thousand pounds of wheat imported. The actual wheat imported is used as a mixture in nearly all the flour that is made. The percentage is somewhat variable. The flour actually exported is not made either wholly or in a greater part of the American wheat imported. One-third per cent. of twenty per cent. would represent the Duluth wheat. In other words, eighty-five and two-fifths per cent. of the products of Duluth wheat remains in the country, escaping duty, while only fourteen and three-tenths per cent. was exported. Consequently Duluth wheat was just as available to Ontario and Quebec millers as Manitoba wheat, and by reason of the bonding system was placed on just as good a footing; and as a further consequence, prices of Duluth wheat absolutely control those of Manitoba wheat. Believing these facts to be correct, the Government is argued to take the matter up before this year's crop is harvested.

For some time past, says an English exchange, there has been a serious misunderstanding between Glasgow importers of flour and the transatlantic steamship companies on the question of the charges made for "master portorage," and in the course of the past month they intimated to them that after the 30th ultimo they would cease to pay more than 10d. per ton of flour, in place of 1s. less 7½ per cent. the charge that had hitherto been ruling. This intimation was at once met by a distinct refusal on the part of the steamship owners to alter the rate. They alleged that they could not abate the rate any further, and that they could not permit the usage that had been established for upwards of twenty-five years to be disturbed, under which the ships' agents performed the master portorage of their cargoes. They further stated that if the signatories to the statements of complaint still declined to conform to the arrangements then in force, with which the great body of the trade were satisfied, they would be under the necessity of protecting themselves by the adoption of such measures as the case required. The flour importers, on the 3rd February, addressed another communication to the steamship owners on the matter in dispute. It stated that the signatories to the first communication represented about 85 to 90 per cent. of the flour imported by the Glasgow flour trade; and it concluded by saying that they were perfectly willing to arbitrate the whole matter of master portorage on flour, although it seemed to them that the terms offered were extremely liberal, and that they had received an offer from responsible parties to do the work at the rates which had formerly been specified. The dispute is still unsettled.

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The Nashua lumber cut for this season will exceed 25,000,000 feet.

Phillips & McLeod, planing mill operators, Aurora, Ont., have dissolved.

It is not likely that the saw mill at Birtle, Man., will be operated this season.

Mackle & Dymont's new saw mill at Barrie, Ont., is nearing completion.

Mr James McLaren of Ottawa will erect a large sawmill at Victoria, B. C.

Messrs. Irwin & Ward, saw mill operators, Euphrasia, Ont., have assigned.

A new saw mill has been built just east of Kimmouth by a Mr. Smith of Toronto.

Mr. J. Fish, Lachute, Que., has sold his sawmill to Mr. John Campbell for \$8,000.

N Baechler, saw mill operator, Beaulieu, Ont., is offering to compromise with his creditors.

The value of products of the forest exported from Canada during April amounted to \$825,954.

The lumber trade in the vicinity of Coldwater, Ont., promises to be remarkably brisk this year.

Almost the entire cut of timber on the Upper Ottawa is reported to have been sold at good figures.

There were 13,400 logs placed in the mill yard of Robinson's mill at Beaver, B. C., last winter.

The capital stock of the Calgary Lumber Company has been increased from \$85,090 to \$170,000.

The Georgian Bay box factory at Penetang, will manufacture a million feet of lumber during the year.

The machinery at the Canadian Lumber Cutting Company's works at Helleville, Ont., is being tested.

Good progress is reported to have been made with the log drives on the Madawaska and Bonaventure rivers.

Casey Bros., planing mill operators, Hamilton, Ont., have assigned. Liabilities, \$8,000; assets, \$3,500.

A jamb of logs 12 miles long is reported to have taken place on the Chippewa river, a short distance above the falls.

Messrs Burton Bros., of Harrie Ont., have taken out 5,000,000 feet of saw logs near the Magnettawan river this season.

Messrs. Moore Bros. are reported to have sold their timber limit on Bye's Creek to Mr. Richard White, of Pembroke.

It is expected that 10,000,000 feet of lumber will be cut this season at the mill of Messrs. Christie, Kerr & Co., Bradford.

Messrs. Heffer Bros., Milverton, Ont., have put a new engine and boiler in their mill.

Mr. Lewis Arnold's saw mill at Monkton, Ont., was burned to the ground recently, with a large quantity of lumber. Loss \$2,500; no insurance.

The probability is that this year more timber will be brought to Belleville by rail for rafting than was ever heretofore brought to the Bay of Quinte.

Among the Acts passed at the session of the Dominion Parliament just closed was one incorporating the Bronson's & Weston Lumber Company.

Messrs J. & J. H. Titus, Smithtown, N. B., are constructing an addition of twenty five feet to their mill, for the purpose of putting in a lathing machine.

Messrs. Harvey & Williams are putting new machinery into their saw mill in Kinson Township, County of Bruce, and will shortly commence sawing.

A planing mill at Brandon, Man., owned by Mr. S. Grigg, of London, Ont., was destroyed by fire a fortnight ago. There was no insurance on the property.

It is estimated that the consumption of lumber is about 500 feet for every individual, therefore every million increase in population calls for 500,000,000 feet of lumber.

Vigars Bros' saw mill at Port Arthur has added new machinery which will give it double its former capacity. It will cut about 3,000,000 feet of lumber this season.

Brush fires in the country back of Kingston are increasing in violence, and spreading rapidly, destroying much valuable timber that had been cut and prepared for the market.

The St. Lawrence Lumber company has been registered in London to carry on in Canada and Liverpool, business of timber merchants and dealers, with a capital of \$50,000.

The Vermilion Bay mills have been purchased by the Western Lumber Co., and will be removed to R. A. Portage. These mills have a cutting capacity of 50,000 feet per day.

A stick of lumber 151 feet long and 20 inches square, believed to be the largest piece ever turned out from any saw mill, has been sent from Puget Sound to an exhibition in San Francisco.

The Granite Saw Mill Co., of Westminster, British Columbia, have built an addition 3000 to their mills, and are putting in new fluting, lathing and boling machinery and a machine for making leather out of slabs.

Application for the incorporation of the Western Lumber Company with capital stock of 500,000, is made for the purchase of timber limits and real estate of every description, the manufacture of lumber, flour, paper, etc., and to run and operate steamboats, etc. The chief place of business is to be Toronto, and the operations are to be carried on in Ontario, Manitoba and the Northwest Territories.

A piano manufacturing firm in Guelph have discovered the adaptability of British Columbia cedar, properly seasoned, for sounding boards, and have given an order for some of the wood to be used for that purpose.

Messrs. Brown Bros. have sold their standing pine and oak timber at Limehouse Station, near Acton and Georgetown, to Messrs. Taylor Bros., of Toronto, who have erected a steam saw mill and will at once proceed to manufacture.

A writer on saw mill building says: "Put a corrugated iron roof on your mill. It won't cost much and you won't have to keep a man on the roof with a pail of water, putting out the fires that are bound to start." That is good advice.

The saw mill dam at Messrs. White & Son's flour and saw mills near Aylmer, gave way recently, and half a million feet of logs and twenty thousand feet of lumber were swept with terrific force into the lower dam, which also gave way. The loss is estimated at \$20,000.

Messrs. John Craigne & Son's planing mill and box factory at Penetanguishene, Ont., and a quantity of dressed lumber on the mill premises, were destroyed by fire on the night of May 26th. Loss, about \$5,000; no insurance. The mill will be rebuilt.

Messrs. Graham & Horne, Port Arthur, have purchased about 3,000,000 feet of logs from Jas. Coumee which will be converted into lumber in Vigars Bros' mill. The firm will probably not operate their Vanistiquid mill, but will use Coumee's mill for dressing their lumber.

The offer of the Canada Atlantic Railway to carry lumber from Ottawa to New York at \$35 per car, will seriously affect the business of American boat owners who have carried much of this lumber at rates averaging about fifty cents per mile more than the Canada Atlantic Co.'s price.

A couple of Michigan men have taken out patents upon a band mill carrying two saws, which is designed to cut in both directions, so that no time is lost in the process of gigning back. A board is cut from the log in running one way by one of the saws, and another by the other saw in returning.

The gentleman whose name has so long been associated with the joggins timber raft undertaking, is a plucky individual, though withal very unfortunate. The latest obstacle to the carrying out of his scheme is an attack of measles which is reported to have broken out among the workmen, incapacitating them for their labor.

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Mr. John McDonagh's saw mill at Thorold, Ont., has commenced work on a large contract of heavy sawn select oak timber for a firm of Oswego builders. The logs were principally secured in the vicinity of Dunnville and along the Chippewa river, where, we were informed, there is still a large quantity of such timber held at high prices.

Mill owners in Nova Scotia are said to be hoping for improved prices this season, principally owing to the fact of the more favorable outlook for the timber trade in England. There is little hope of a market for Nova Scotia lumber in the Eastern States even with a reduction of duty, as West India and South America shipments pay more than present prices even without duty.

The Madawaska Lumber Co. is threatened with suits for damages by residents of Combermere, Renfrew Co., which place was lately flooded, owing, it is alleged, to the Company's neglect to leave a sufficient opening to draw off the water in a dam which they constructed six miles below the village to hold water in reserve to assist the descent of timber and logs on the river.

Five large Chaudiere concerns are estimated to have cut a total of 375,000,000 feet of logs the past winter. The reserve of logs on hand from last year is very small, and prospects for the season are satisfactory. Quebec lumbermen anticipate a fairly prosperous year. Prices of deals are at least ten per cent. higher than a year ago, stocks in England are said to be much lower than for many years, while the American demand for lumber is said to be better than was expected.

The Birtle, (Man.) Observer says:—During the week the river has been crowded with saw logs. A slide has been constructed at the mill dam and many thousand sticks have been sent down stream. It is generally believed that it will be impossible to take such a number as 46,000 logs from Birtle to the mouth of the Assiniboine river in the present low condition of the water. The bed of the stream is for many miles obstructed by large boulders that now stand partly above the water that passes between the stones. A heavy rain might help the drive onward but the chances are that the logs will not get through.

The Canadian Lumber Company's large saw mills at Carlton Place has been entirely rebuilt and enlarged during the past winter, and are now among the most perfectly arranged and best equipped in the Dominion. The Herald gives the following description: The log is floated to the foot of the slide and there caught by an endless chain, on which are hooks, which draws it up into the mill and registers it as it enters. The log is then turned to right or left as required, and sent by steam process to either the large circular or twin circular. The rings to each of the circulars are operated by steam (the cylinders being beneath them) and run very fast, as are also the rollers throughout the entire mill—known as live rollers. The logs are also held in position and forced by steam appliances. After the logs are slabbled they are thrown to the centre and piled up two deep by means of large cranes, and then sent through the large gang saws—four logs passing through at one time. The boards are then conveyed by the system of live rollers and side endless chains to the different

smaller saws for edging and butting, and finally thrown out of the mill to a car which conveys them to the piling ground. The edgings and slabs are cut into four feet lengths by as many saws and dumped into a large receptacle underneath, from which they are conveyed to the mouth of the furnace. Here they are assorted, that fit for laths going back to the mill, that for wood turned into large boxes from which it is dumped into the carts for delivery, and the balance into the fire. The whole course of the log from its entrance to its exit is one of uninterrupted evenness, and illustrates a most perfect system of mechanism. Besides the revolution in the machinery, the appearance of the building has been greatly improved. New windows have been added, the whole inside of the mill upstairs and down has been whitewashed, giving everything a bright appearance. All the buildings outside have been painted a uniform color. The electric light (which is operated by water power—the only water power now used) illumines the whole at night. The engine house has been enlarged. The office is being removed to the corner of the lot on Bell street, and much improved in appearance.

An Ottawa despatch says: The Government threatens to cancel the leases of water lots and water power to lumbermen surrounding the Chaudiere Falls for non-compliance with the terms of their leases. Many of these great lumber firms owe many thousands of dollars rent to the Government. Messrs. Perley & Pattee and Bronson & Weston, two of the largest firms in Canada, owe about \$13,000 each in this way. The various firms support their refusal to pay chiefly on the ground that at times the water power is not equal to what it is stated in the leases to be. Most of these leases were granted about the year 1856. The Government threatens to institute ejectment proceedings if the rent is not paid.

In a description of the town of Calgary, N. W. T., printed in the Winnipeg Sun, the following reference is made to the largest lumber firm in the Northwest: The Eau Claire and Now River Lumber Co., organized in 1883 with a capital stock of \$300,000, is situated at Calgary, N. W. T. The company have purchased ten timber limits situated on the Bow, Spray and Kanabaskus rivers, covering an area of 500 square miles, estimated to contain 300,000,000 feet of growing timber, which is cut and put into the rivers and brought to Calgary on water down the Bow river, where they have established the largest sawmill in the N. W. T. They have also in connection with their mill a dam and expensive river improvements, booms, piers, etc., in order to hold and handle the large cut of logs brought down each year. They have for this year's manufacture five million feet of logs, and are in a position to furnish anything in the line of building material, etc.

The exports of wood goods to the United States from the Ottawa district during the first three months of the present year were as follows:

	Feet.	Value.
Sawn lumber, for duty.....	19,101,970	\$266,456 04
" " re-export.....	3,438,595	92,804 28
" " total for quarter.....	22,540,495	\$314,260 32
Lath.....	2,911,550 pieces.	3,659 30
Hemlock bark.....	1,772 cords.	8,860 00
Hop poles.....	15,580 pieces.	666 00
Railroad ties.....	74,005 "	15,795 95
Fence posts.....	4,422 "	250 30
Box shooks.....	13,257 20
Firewood.....	145 cords.	241 33
Shingles.....	968 M.	1,686 70
		\$354,797 12

We learn from the Edmonton Bulletin that the damage to timbers on the head waters of the Saskatchewan and the Athabasca this spring has been very great. The country from the sand to the 55th degree of north latitude and from the Rocky Mountains eastward to about the 5th principal meridian contains the available supply of sawing timber of the Northwest. The area of this region is very great, but it was never as densely or as uniformly timbered as the wooded lands of Eastern Canada. The good spruce is in patches with considerable areas of scrub and even open prairie. However, the whole region is so thoroughly cut up by the main streams mentioned, their greater tributaries the Red Deer, the Brazeno, the Pembina and the McLeod, and many smaller branches that the greater part of it is really accessible. Many million feet of spruce well fitted for lumber, which within the memory of man was standing green and growing in the country mentioned is now lying in brule of no use for any purpose, an impediment to travel and furnishing a perpetual supply of tinder with which to kindle and spread new fires. Even within the past five years the loss on known and immediately available timbered lands must have mounted into the hundreds of thousands of dollars. As is well known, in the Northwest series of wet and dry years alternate. During the former the timber is comparatively safe, the only loss arising from local fires in the fall. No matter how dry the weather may be for a time the ground is always moist, and when it is so the fire does not travel far. After a succession of dry years the reverse is the case. The soft mould, full of vegetable matter, becomes thoroughly dry and in the woods even heavy rains fail to wet it. When fire is once started in a section of country having such a soil in such a state it is bound to run through it all. Nothing has ever been done to stop this destruction. The timber destroyed had no market value and no one was interested in it. Now, however, matters are different. Local saw mills are turning the spruce to account in yearly increasing quantities and eastern speculators have seen the bottom that must be in limits of good timber lying on the headwaters of navigable streams flowing in the lower part of their course through agricultural lands. There is bound to be an influx of immigrants shortly who will need this timber and will cause the loss of every stick to be felt. At the same time the past dry seasons have brought the country into the condition in which it is most liable to fire.

Ground has been broken for the new Toronto Rolling Mills works.

DESCRIPTION OF A BRANTFORD MACHINERY DEPOT.

NOTHING shows the steady growth of Brantford better than the continuous solid growth of her institutions. Brantford has always been known as an emporium for iron goods of every kind, and the firms which handle this class of wares have obtained a world-wide celebrity. Foremost among those firms which handle machinery exclusively is that of H. W. Petrie. Last fall Mr. Petrie was compelled by his ever-increasing trade to erect a substantial three-storey brick addition to his already large warehouse on Dalhousie street. In the front of this addition is the general office, and immediately behind is Mr. Petrie's private office. The offices are fitted with the latest conveniences for assisting office work, while a large Goldie & McCulloch vault insures the safe keeping of valuables. Through a door in the general office one enters the shipping room, which will in a few days be fitted with a complete set of steam hoisting machinery, so that the heaviest machinery may be brought in, unloaded from the drays, and whisked off to a second or third storey, or put in any desired position in the show room, without the need of a hand being laid to it. Next to this is the show room, extending the full depth of the building. Here is gathered together machinery from all parts of the Dominion, the greater part on this flat being perfectly new, and ready at any moment to be shipped away. Besides handling new machinery of every description, Mr. Petrie probably buys, refits and sells more second hand machinery than any other dealer in the province. Back of the show room is the repairing shop, in which every second hand machine that comes in receives a thorough overhauling. The machinery on the ground floor is mostly of the heaviest description, planers, saw mills, engines, boilers, and lathes for wood and iron. In the shipping room are boxes of machinery waiting to be shipped to different parts of the Dominion. Here is a saw mill which will shortly be engaged in waging a battle against the Douglas fir of the Rockies. It is addressed to Lillooet, B. C. Beside it is another addressed to Stittsville, among the pineries of the Ottawa valley. Another lot is designed for the Muskoka district, and still another for Richibucto, N. B. These, with a host of others intended for places nearer home, show the extent of Mr. Petrie's trade. Upstairs the woodwork and painting is carried on. Here, spread out on the floor, are the parts of two saw mills which are being arranged before being shipped away. Near them is a broom machine which will turn out finished, tapered handles at the rate of six hundred per hour, and beside it is another of still newer pattern, which turns out a continuous stream of handles. On this floor is a collection of small engines designed for running a row of sewing machines and turning coffee mills. Here also is an axe handle machine which will turn out thousands of axe handles per day, all moulded to pattern. Passing to other rooms on the same flat we find an immense collection of leather and rubber belting, and rubber hose of every description. Next to this there is a collection of several thousand drills for iron work. Back of this again is another room crowded with all sorts of light machinery. Here is a machine for drawing by suction sawdust and shavings, a quarter of a mile if needs be, through pipes to the furnace of some vast saw mill. There is a machine for cutting barrel heads, this one husks, and that one grinds cob and kernels at once into meal for cattle. This contrivance of wheels and bars cuts out spools almost by the bushel, while over against the wall is the pilot wheel and anchor of a steam yacht; hence the expression, "from a needle to an anchor," may be applied correctly here. The third flat is a repetition of the first and second, except that the machinery there is somewhat lighter than that below. One of the rooms on the second flat gives us an insight into the methods that have enabled the proprietor to build up this magnificent trade. From top to bottom of the room are shelves filled with illustrated catalogues, in which every machine in the building is exactly described and numbered. Advertisements are inserted in all the great papers of Canada, and a number of those of the United States, and when a query is received as to some particular piece of machinery, off goes a copy of the catalogue, giving the illustration and description. Last year 20,000 of these catalogues were printed, which, proving insufficient, a further supplement of 5,000 was obtained. The majority of buyers never see Mr. Petrie, the buying being done by letter, and it speaks volumes for the integrity of the proprietor, that he has thus been able in every case to satisfy his customers.

At the Market street station the firm have another large warehouse, where the heaviest kinds of machinery are stored. A switch runs right alongside this warehouse, so that boilers, engines, etc., weighing many tons, can be handled to and from the cars with the greatest

ease. Inside the warehouse as we enter there is a hundred horse power engine, which in a few days will be shipped to Colpoy's Bay, to run one of the giant saw mills that are to be found in that region. Outside on the platform is the fly wheel for this engine some ten feet in diameter, and weighing four or five tons. Near this is a biscuit making machine, fitted up with all the devices for turning out every kind of biscuit known to the trade. Further down in the shed is a hand fire engine, which has just come in from some village that has become ambitious enough to buy a steam engine. Near it are several three-hing machines with their complement of traction engines to draw them about in the fall. There are also here a number of portable engines on skids, which are intended to run saw mills, stone crushers, etc. Near the door is a planer and matcher, which will shortly be shipped to Hastings county, and near it is a stave cutter intended for the north-western part of the province. Outside are a pair of hydraulic rams, quiet enough now, but powerful lifters when put in action. Water wheels of every kind, size and description are piled up around, while a part of the yard is specially devoted to boilers of the largest kind. On the platform near the south is a hundred horse power boiler, ready to be shipped to the north, where it will keep the saws of a monster mill in motion. Smoke stacks of all sizes and length are piled up, ready to go out with the engines and boilers. On the platform, too, are several large drills and planers for heavy iron work, and near them is a curious machine that will turn out a steady stream of barrel hoops. By its side is a solid, grim looking machine of iron and steel, whose ravenous jaws will shortly be put to work grinding cinders for the asphalt sidewalk of this city.

Altogether this is one of the most bustling and busy establishments of our city, and as for the rest, Mr. Petrie's name is synonymous with reliability and square dealing throughout the Dominion.

HEATING WHEAT.

THE benefits of heating wheat are realized in several ways; drawing out the frost in winter, imparting a uniform temperature to the berries, ripening grains not fully cured, and bleaching the flour very much as age does. The toughening is due to the fact that most wheats possess sufficient moisture, providing it be drawn out from the centre and retained by the outer coating. The operation of causing a confined body of grain to pass between heated metallic surfaces vaporises the internal dampness, which expands, and penetrating to the bran covering, is held by the fibres of the latter. The little that escapes rises and condenses on the kernels that are still cold; these in turn, when heated, giving up the same proportion of their moisture to those above. Thus are brought about those most desirable conditions—a tough exterior and a brittle interior. Exceptions are noted where wheat has been so exceedingly dry all through the berry that heating becomes more of a detriment than a benefit. When such is the case, and the temperature of the mill is not too cold, the difficulty can be overcome by wetting in any of the customary ways before passing the grain to the heater. In summer, when the thermometer in the mill ranges from 70 to 100 degrees, the natural heat, with good arrangement for sprinkling, is all that should be employed. After wetting, the wheat should be allowed to stand in a body for from two to six hours.—J. H. Lisk, in *Roller Mill*.

PUBLICATIONS.

WE note with pleasure that our excellent American contemporary, the *Progressive Age*, will in future be published semi-monthly instead of monthly as heretofore. The publication offices, too, have been removed from Philadelphia to New York. The *Progressive Age* devotes itself entirely to gas topics, and is an ably conducted journal.

We have received from the author a copy of a "Manual of Engineers' Calculations," by D. McLaughlin Smith, late clerk of Steamboat Inspection Office, St. John, N. B. This work, which is designed to assist engineers desirous of passing the Board of Steamboat Inspection, contains rules for working and answering the kind of questions usually propounded to such candidates. The book contains many valuable tables and a number of illustrations. A beautifully engraved portrait of the author's father, Wm. M. Smith, M. E., forms the frontispiece to the book, and a sketch of his life is also found in its pages. Persons interested in the subjects of which this book treats will find its contents of great practical interest and value.

Our esteemed contemporary, the *Sanitary News*, has advanced its subscription price from \$2 to \$3 per year.

ELECTRIC SUN-STROKE FROM FORGES.

MUCH interest has been manifested in "electric sun-stroke" as described in a paper recently read before the French Society of Surgeons by M. Defontaine doctor-in-chief to the Creusot Steel Works. M. Defontaine states that workmen employed in operating the electric forges at Creusot are subject to a form of sun-stroke, which he attributes to the intense light radiated from the focus of the forge. Ordinary arc lamps are incapable of producing such effects, as the light is not sufficiently intense, but these forges emit a light of more than 100,000 candles from a few square centimeters of surface, producing on men exposed to their glare physiological consequences previously unheard of. Frequently, after two or three hours' work, the men complain of pains more or less in the neck, the face and the forehead, simultaneously with which the color of the skin is changed to reddish-brown. Further, in spite of the precaution taken of shielding their eyes with dark glasses, the retina is affected to such a degree that for some moments after ceasing work the operatives are totally blind to all objects illuminated with common daylight, nor is perfect vision restored till nearly an hour after. The conjunctive are irritated and remain in a state of congestion for 48 hours, and this is accompanied by a painful feeling as of some foreign body introduced under the eyelids. The secretion of tears is augmented, a constant flow being kept up for 24 hours, during which the patient suffers from insomnia, due to pain and the abnormal flow of tears, and possibly also to fever. During the following days the skin peels off the face and neck, which become of a deep red color, fading away about the fifth day. In cases of ordinary sun-stroke heat may have some influence, but in those considered above the whole effect is due solely to the action of an intense light.

WHAT IS LATENT HEAT?

HEAT has its equivalent in mechanical work, and when heat disappears work of some kind will be done to take its place. When a body changes from the liquid to the gaseous form the molecules have to be separated and placed in different positions with regard to each other. This calls for an expenditure of work. This work is supplied by heat which disappears at the time. One can hold his hand on steam escaping from the safety valve of a boiler for this reason. The heat of the steam disappears in pushing apart and rearranging the molecules of the steam as it expands when it leaves the safety valve.

The term latent heat, as commonly used, means the amount of heat which disappears when water changes from a liquid into steam. This is considerable, as will be seen by consulting any table of the heat contained in steam and the water from which it came.

Water at 212 degs. contains 180 units of heat. Steam at 212 degs. contains 1,146 units of heat. The latent heat is the difference of 966 units. Such a large quantity disappears when liquid water changes to steam that boiling water cannot be raised above 212 degs. no matter how hard it is boiled. The heat becomes latent and the mechanical work or, rather, molecular work is sufficient to take up all that is supplied by the fire.

HOW TO SECURE CLEAN CASTINGS.

CLEAN castings are not always easy to make. A European authority gives a method used by a Duesseldorf firm to separate the light impurities from molten iron or other metals in the operating of casting, with a view to securing pure and clean castings. The "separator" is placed upon the inlet aperture of the molding-box and consists of a rectangular casing provided with a number of transverse partitions, dividing the casing into a series of separate chambers, which are in communication by means of openings at the bottom of the partitions. The molten metal is poured into the separator at one end and is caused to pass through the several compartments in the apparatus before it can enter the moulding-box, the light impurities being in this way caused to rise to the surface and prevented from entering the mould with the metal. As the metal passes from compartment to compartment more and more of the impurities are separated, until the metal reaches the inlet to the mould in a practically pure state; air is also effectually prevented from entering the mould together with the metal. In the second chamber there is arranged near the inlet a round iron rod, which produces ebullition of the metal, causing the impurities to rise to the surface. It is stated that by the use of this apparatus exceeding dense and pure castings may be produced.

About 1,000,000 feet of lumber is reported to have been lost by the breaking of the boom at Fredericton, N. B.

Queen City Oil Works.



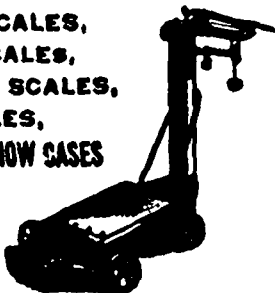
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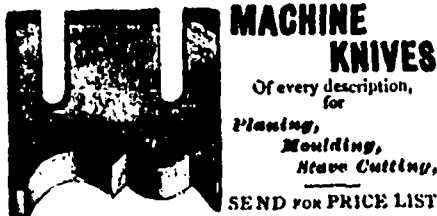


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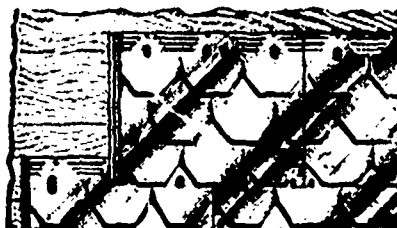
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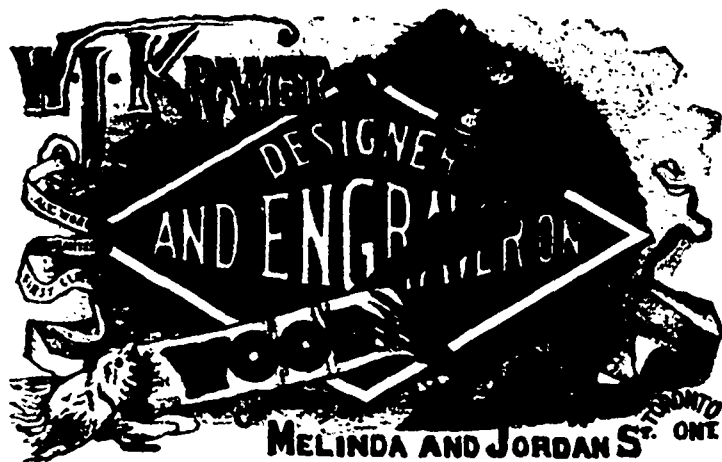


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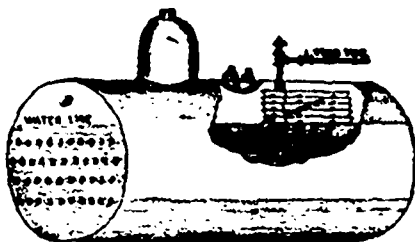
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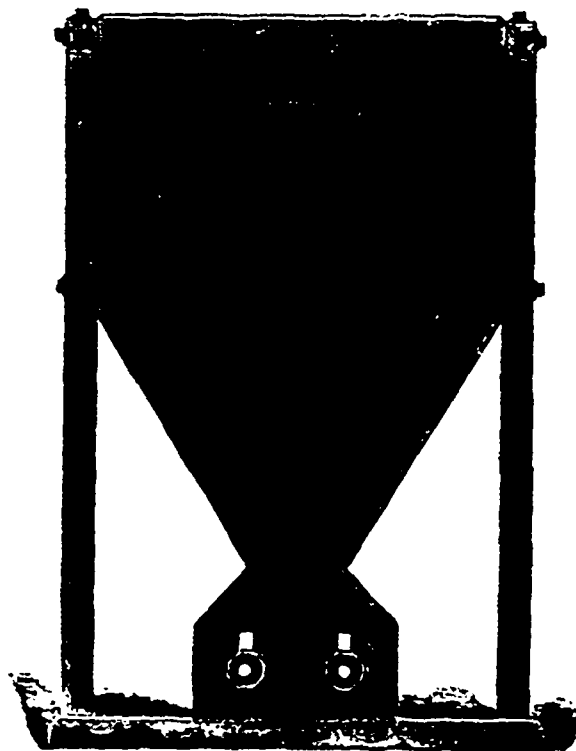
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THE SILVER CREEK FLOUR BOLT.



THIS Bolt is enclosed in a strong, substantially built frame, and put together in a manner peculiar to our work. Inside the cylinder is secured in a novel way a stationary arch or bridge, the radius of which comes within one-half inch of the travel of the elevators. On the up-going side this bridge forms part of a true circle, but from a short distance past the highest point on the down-going side it has a flat surface upon which are placed slats or gates by means of which the travel of the material being treated can be regulated at any point. The motion of the cylinder is from 24 to 34, according to size. Its capacity is immense, and we do not hesitate to say is greater than that of any other machine on the market. The objection to the centrifugal system of bolting, of high speeds, is overcome.

It secures the dashing action at a low speed; its elevators continually elevate the flour, gently dashing it against the cloth. On the up-going side it is dashed against the bridge, and from this repeatedly against the cloth, which action is renewed by the down-going side on all the flour carried over the bridge. In other words, instead of having beater chase beater at high speed, say 200, we dash the flour from the elevators on the cloth and against a stationary object, the bridge, by running them at low speed—say 30. The eddy under the bridge is quite as spacious as that in the centrifugal, and the liberated specks float into it and toward the tail as readily as they do in the centrifugal, securing the same air separation and capacity at a minimum outlay of power. We have a number of these Bolts now in use in mills we have built, and their work is highly satisfactory.

Write for Descriptive Circulars and Testimonials.

INGLIS & HUNTER

STRACHAN AVENUE.

TORONTO, ONTARIO

BRACING BOILER HEADS.

THE following interesting article on the above subject we find printed in the *Locomotive*, published by the Hartford Steam Boiler Inspection and Insurance Co., Hartford, Conn. :-

The proper bracing of flat surfaces exposed to pressure, which are necessarily present in almost all forms of boilers, is a matter of the greatest importance, as the power of resistance to bulging possessed by any considerable extent of such a surface, made as they must be in the majority of cases of thin plates, is so small that practically the whole load has to be carried by the braces. This being the case, it is evident that as much attention should be given to properly designing, proportioning, distributing and constructing the braces as to any other portion of the boiler. This is not, however, always done, and it is no uncommon thing to subject new boilers to hydrostatic pressure well within the limit of strength of the shell, and so strain the bracing that the heads are bulged to quite an appreciable extent, and when the pressure is released the braces are found to be loose and badly strained. The prevalent idea regarding bracing is, that it should be just sufficient to prevent "vibration" of the heads. There is no objection to regarding it in this light if we consider properly just what is required to effectually do it.

The subject might be profitably discussed in a general manner, but we think more advantage will be derived from the consideration of an actual example, such as would arise in daily practice.

Suppose, for example, we are designing a boiler 72 inches in diameter. How many braces shall be put on the heads above the tubes?

We first arrange our tubes. Let us assume that they are 3 1/2 inches in external diameter; then a good arrangement of them, paying due regard to a free circulation of the water, will admit about 86, and will leave a clear height from the top of the upper row to the top of the shell of 29 inches. (See Fig. 1.) Then it is evident that this segment, 29 inches high, of a circle 72 inches in diameter, constitutes the surface to be braced, and we must next ascertain the strength of bracing required to render it safe.

Let us consider first just how much of the pressure on this segment must be carried by the braces, and how much shall be allotted to the flange of the head and the top row of tubes. For it is evident that as the area to be braced is bounded by these parts, and they possess ample strength, they may be calculated to sustain their due share of the load.

The flange of the tube sheet may be assumed to have a radius of two inches. This curved portion will take care of itself, and, if it had a chance to do so, a great deal more besides. So we draw the line A-A' with a radius of 3 1/2 inches, and disregard the portion outside of it.

Now, we know that on heads or flat surfaces of ordi-

that the load on the area between it and the flange may safely be borne by the flange itself.

Now, how much of the load on the head above the tubes may be safely carried by the tubes themselves? We know by experiments that the tubes, if well put in, have a great holding power when new. We also know that if the water used is corrosive, or the fuel is of such a nature that its gases attack the ends of the tubes externally, they may in time corrode and lose much of their holding power. If this were not so then we should be justified in keeping away from the tubes 8 inches or so

the outside to realize strength equal to the body of the brace. We have seen cases where the rivet used was so short that when hammered down outside the head was so thin and weak that it stripped off under the test pressure. Such scrimping of material is very poor economy in the long run.

Figure 2 shows an arrangement for a different form of brace. Four-inch T irons are riveted to the heads, and the braces with forked jaws, are attached to the web by a turned pin or bolt. The T irons are, so far as practicable, so arranged that the rivets which secure them to the heads will fall in about the same position that they would if crowfoot braces were used, that is, they should be distributed as uniformly as possible. This enables a less-number of braces to be used, but they should be somewhat larger. Owing, however, to the stiffening of the heads by the T irons, which act as girders and transfer the stress due to the pressure of the flange and the tubes, it is usual to make these braces but one inch in diameter. We have never known the least trouble to occur where a boiler was braced in this manner and the work was well done, and recommend it as a superior form. Fig. 3 shows the detail of the brace and its connection. Two angle irons are sometimes used instead of the T irons with this form, but the T irons are to be preferred, as they are free from from the "claw hammer" strain which is unavoidable when the angles are used.

Many boiler makers prefer to arrange the T or angle irons horizontally across portion of the head to be braced instead of radially. This form is shown in Fig. 4, and there is no objection to it provided the braces are swung horizontally to the point of attachment to the shell. When they are swung upward, as they are in the majority of cases, an awkward bend is necessitated in the brace, and a square pull on the jaws is impossible, and the consequence is they do not remain taut

for any great length of time. They should never be put in in this manner. When we wish to resist a direct pull a straight piece of material is the best thing to do it with, and there is no reason for using anything else to brace a boiler head with.

Another favorite style with some makers consists in riveting heavy forged bars horizontally to the heads above the tubes. These bars are provided with projections, to which are attached heavy braces extending from head to head. The objection to this form of brace is, that it offers a very serious obstruction to a proper examination of the boiler, and is very much in the way when cleaning and repairs to the inside of the boiler becomes necessary. The principle embodied, that of tying

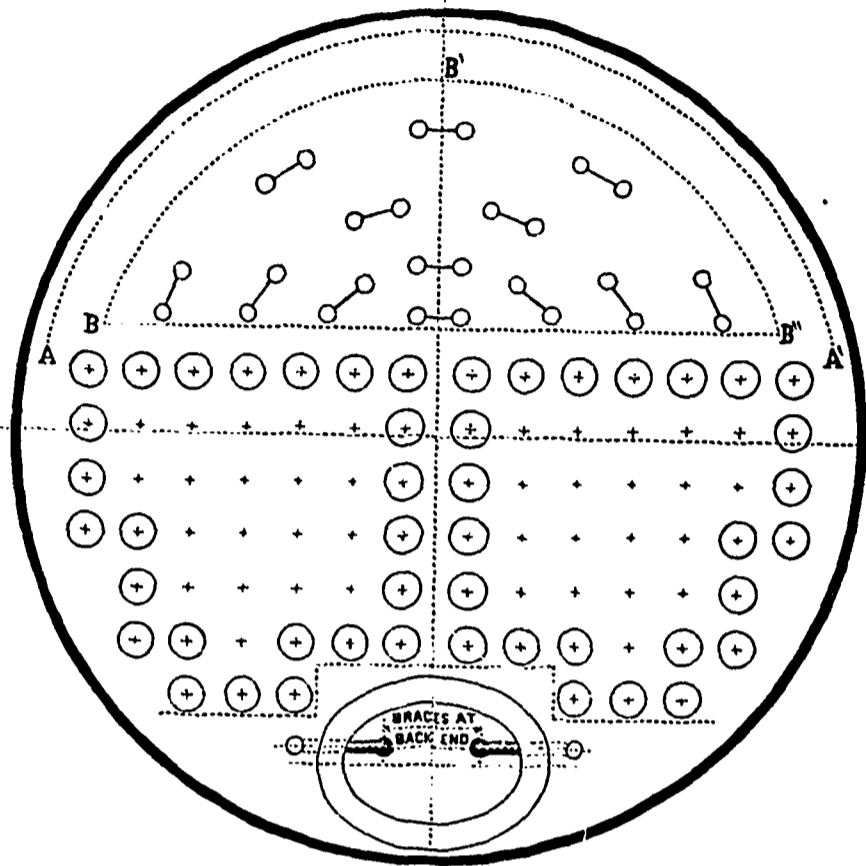


FIG. 1.

with the nearest brace: but for the reasons above stated it would be deemed judicious to brace closer down to the top of the tubes, so that if a portion of them lose their holding power, the boiler will still be perfectly safe. So we would put the line of braces as nearly as might be

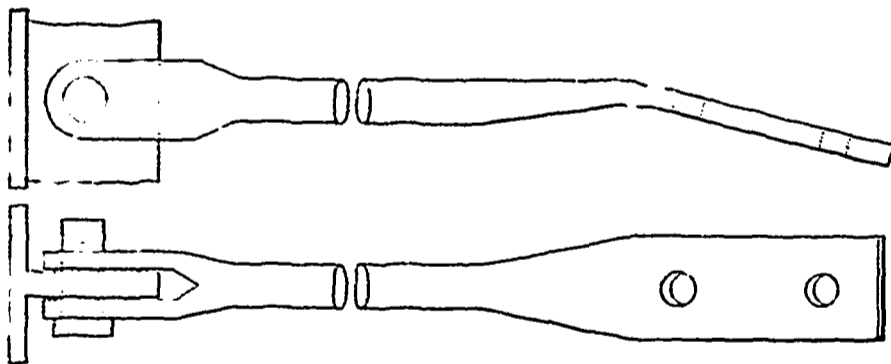


FIG. 3.

4 inches above the top of the upper row of tubes, and drawing the straight line from B to B', 2 inches above the tubes, put in braces enough to carry safely the pressure on the segment of the head B B' B'.

The area of this segment is easily computed by means of the table given in the *Locomotive* of December, 1886, page 184. In this case it is a segment 21 inches high of a circle 60 inches in diameter, and its area is 882 square inches. The braces should be sufficient to carry safely the entire pressure coming on this surface. If the boiler is intended to carry a pressure of 100 pounds per square inch, it would aggregate on this segment 88,200 pounds, and the braces should be sufficient to safely sustain this pressure. The number of braces required will depend upon their form. If of the ordinary crowfoot pattern, which if well made is as good as anything yet devised, and 1 inch in diameter, they could safely be allowed to sustain a tensile stress 7,000 pounds each. This would give 88,000 ÷ 7,000 = 13 braces, which should be distributed as uniformly as possible over the surface to be braced, about as shown in Fig. 1, making the arrangement as symmetrical as possible, grouping them slightly closer to each other near the center of the head than we do out toward the flange. The braces should be attached to shell and head by two rivets at each end. The rivets should be of such size that the combined area of their shanks will be at least equal to the body of the brace, and their length should be sufficient to give a good large head on

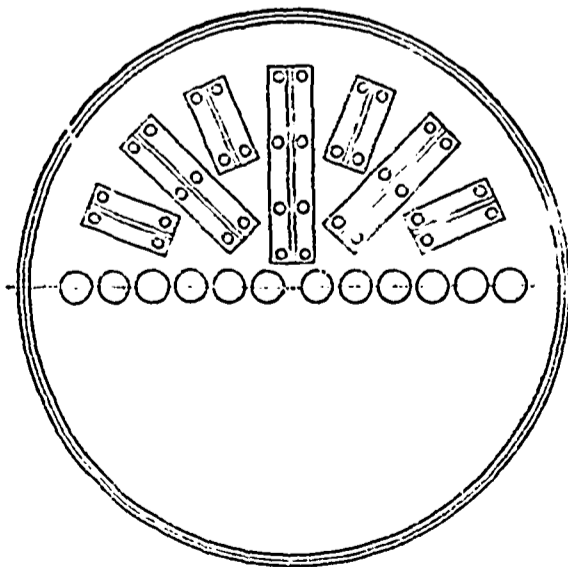


FIG. 2.

nary thickness the pitch of stays should not be much more than 8 inches from center to center. In the fire boxes of locomotives and similar boilers they must be much closer, but the head of an ordinary boiler is not exposed to such intense heat, and they may be placed much further apart with safety. So we draw the line B B' B', with a radius equal to 30 inches, and consider

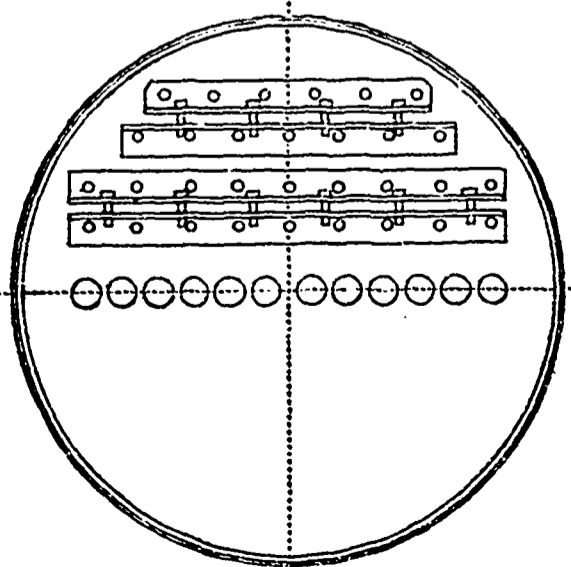


FIG. 4.

the heads of the boiler together, is all right, but it should be remembered that boiler shells have an excess of strength in a transverse direction to carry all the pres-

sure that can come on the heads, and so ample strength is secured by bracing back well on the shell. We have yet to learn of a case where braces attached to the shell have caused an explosion by the strain on them tearing it apart transversely.

In localities where the water available for use in boilers is very bad, a man-hole in the front head below the tubes will be found very useful to enable the bottom of the shell to be kept clean. Now, it is evident that a portion of each head equal at the least to the area of the man-hole frame (see area below dotted line on lower part of Figure 1), will be deprived of the supporting power of the tubes, which must be displaced to admit the man-hole, and this unsupported area should be properly braced more especially that at the back end. This is done in a variety of ways. Some run crowfoot braces from the head back on to the shell. The objection to this is, the foot of the brace where it is attached to the shell is apt to form a lodging place for sediment, which will accumulate until there is danger that the shell may be burned at this point. The better way is to put in through braces here, extending from head to head, leaving the bottom of the shell entirely clear. Various methods are practiced of attaching these braces to the heads, but the most preferable would seem to be: make the brace of round iron 1 1/2 inches in diameter; upset the ends to 1 1/2 inches diameter, and cut a full smooth thread on them; drill and tap the heads for this thread, and screw the braces through, making them just long enough to enable the ends to be headed down nicely outside, after the manner of an ordinary screw stay. This will leave no chance for sediment to accumulate.

When this form of brace is used they should not be run through parallel with the direction of the tubes; if they are, they will be of very little account as braces of the back head. For their ends must be separated at the front end by a distance of at least two or three inches more than the greater outside diameter of the man-hole frame, or say about 24 inches; if they are run

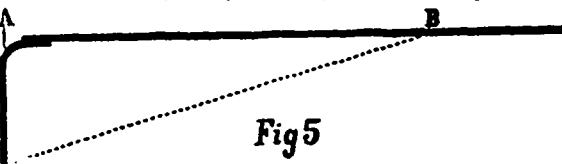


Fig 5

through parallel this same distance on the back head will be wholly unsupported, and will be apt to bulge sooner or later. The braces should therefore be brought closer together on the back head; from 9 to 10 inches apart will generally be found to give a better and more uniform support to the back head where a man-hole of ordinary size is used in the front head. This is shown in Fig. 1 with sufficient clearance to render further explanation unnecessary.

A few words concerning the frames usually put around the man-holes in boiler heads may not be amiss. The common practice is to rivet on a wrought-iron ring about half an inch thick and as narrow as can be used and get a rivet through it. This is entirely insufficient for the purpose, and the practice may be described as entirely too economical, or some stronger name may perhaps be profitably applied to it. This ring should under no circumstances be less than 2 1/4 inches wide (2 1/2 inches would be better), and one inch thick (from 1 1/4 to 1 1/2 inches thick would be much better). Then a degree of stiffness would be imparted to the front head, if a suitable plate were used, which would insure perfect freedom from trouble. It is no uncommon thing for these thin, narrow rings to give out under the hydrostatic pressure while the boilers are being tested.

On a diagonal brace, which term will apply to any brace which is not parallel to the direction of the stress applied to it, such as gussets, braces attached to heads and having the other end attached to the shell, etc., the strain is theoretically somewhat greater than it would be if the brace were parallel to the direction of the stress applied. The actual stress on the brace may be found by dividing the total pressure on the area supported by the brace by the cosine of the angle between the brace, and the direction of the stress. Or to arrive at the result without resorting to calculation, lay out the brace in correct proportions, as shown in Fig. 5. Then, if the pressure on the area to be braced is represented by the length of the line A-B, the length of the brace B-C measured by the same scale will represent the actual stress upon it. With the ordinary proportion of braces, the difference is so small it may be neglected, but where the brace makes a comparatively large angle with the shell, as may be the case with gusset stays, it should be taken into account, and the brace made correspondingly large.

SPOUTING IN FLOURING MILLS.

ONE of the vexations of a miller's life, says R. J. Abernathy in the *Milling World*, is trouble with choking spouts and elevators. It is no doubt true that the best and most carefully constructed spouts will occasionally choke, but if reasonable care is taken in constructing and putting up spouts, the trouble would be reduced to a minimum. The first care in constructing wood spouts is to be sure that they are large enough to afford a free passage to the material to be spouted. The inside should be dressed very smooth. The softer the material the wider the spout and the smoother the inside should be. To get a sufficient slant or pitch is sometimes troublesome, but it is better to go to extra trouble and expense to give a spout pitch enough than to put it up so as to have it constantly choking. When at a loss to know just what to do in the matter of pitch, when the points from and to are mixed, the correct way to decide is to procure some of the material intended to pass through the spout and try how it will run at the sharpest angle that can be obtained between the two points, and if it refuses to run, or, if at all, very sluggishly, it will be just as well to abandon it, as it will have to be done sooner or later. Change the plans by lowering the discharging point or raising the receiving point, or both, or else put in a conveyor. By all means, though, make the conveyor part of it a last resort. Spout always and never convey when it can be avoided.

If the spout is flat-bottomed, without circular lining of any kind, be sure to make the level crosswise. A spout may be made to run very well if constructed for that purpose and put up with that end in view, but if it is intended for a flat-bottomed spout and set so that the material will run to the corner, it will be sure to choke. Spouts have sometimes to take different directions in reaching an objective point and have to be connected together at the diverging points, and there is where care must be observed to prevent any inside projections on which material can catch and hang. Unless spouts have a pretty sharp pitch downward, they are liable to give trouble at the joints with soft material. Another very troublesome place is where a spout enters the boot of an elevator. If the spout is too flat and enters the boot too low, there are sure to be chokes in great numbers, with chop or any other soft material. It is better always to discharge a spout into an elevator boot on the lifting side and above the centre of the pulley. The material will then be emptied directly into the buckets and would not have to be scooped up, as is the case when discharged below the centre and into the bottom of the boot. Returns or other light streams may be discharged into the down-leg of an elevator, but it is not advisable to empty a heavy stream of any kind in the down leg. This must be done only when it can not well be avoided. Always shove the bottom of the spout through into the boot of the elevator, and do not stop it on the outside, as is sometimes done, because in the latter case, if the bottom of the spout is set a little too low, as is liable to be done, there is a shoulder left caused by the spout being below the bottom of the opening in the boot, against which the stuff will lodge and cause chokes. When the bottom is projected through the opening, all that is avoided, and the further through it goes, so long as the cups do not strike it, the better it will work.

Similar care must be observed in the sides of the spout. If the spout is made larger in the clear than the hole in the boot, there will be shoulders on the side which, while not so bad as when on the bottom, are still objectionable and liable to give trouble with soft and damp stuff. These matters look very small, but it is looking after the small things in spouting that saves trouble. The millwright having a reputation as a spouter prides himself in being able to do the work quickly and neatly, but he may overlook such trifles as are here mentioned and thereby make his nice-looking job work very badly. When a good tinsmith can be procured, who understands the business, many of the more difficult and troublesome spouts can be made of tin, as in that way it can be done cheaper and quicker. A good tinsmith can make a turn in a spout with much more celerity than can the most skillful wood workman. Tin spouts should be round and not too small, never less than three inches in diameter for the smallest streams. The large streams require four inches and upwards, according to volume. The angle at which material runs freely varies greatly in accordance with the kind. Cleaned and dry wheat will run very freely at about 16 1/2 degrees, but it ought to have 22 1/2 degrees in practice. The softest flour material requires nearly 60 degrees to make it always sure, though in a spout sharp dry flour will run freely at 45 degrees. Be sure there is pitch enough. At the same time, do not give spouts for free-flowing and heavy material too much

pitch, especially if discharging in the legs of elevators, as it makes them "blow." Grain spouts should not have too much pitch, because the rapid moving grain wears the spout out very fast.

The New York Steam Company, with boilers 20,000 horse power capacity, promises steam at 80 lbs. and upward, through five miles of mains, some of which extend three-quarters of a mile from the boiler station.

IRON SMELTING IN TORONTO.

UNDER the above heading Mr. Sam. D. Mills contributes to the *Toronto Mail* the following interesting statement regarding the feasibility of manufacturing iron in Canada from Canadian ore:

Allow me to lay before the public, and especially before those resident in Toronto, the following facts and figures in regard to what ought to be one of Canada's most prosperous industries. The importations of iron into the Provinces of Ontario and Quebec for home consumption only for the fiscal year ending June 30th, 1887, were as follows:—

	Ontario.	Quebec.
	tons. cwt.	tons. cwt.
Hoop and bund iron.....	2,141 15	2,555 6
Bar, hammered, etc.....	13,783 8	21,468 8
Boiler plate.....	1,993 17	3,918 0
Slabs, blooms, etc.....	578 12	25,186 16
Structural iron.....	483 17	1,812 17
Channel bar, etc.....	2,222 6	2,354 18
R. R. iron and fish plates.....	739 17	6,925 6
Sheet iron.....	571 12	1,220 16
Steel ingots and bar.....	4,307 17	5,659 8
Coke iron (pig).....	16,062 00	25,802 0
Totals.....	42,184 18	97,808 15

These figures show the actual importations from Great Britain, the United States, Germany, Belgium, &c. They do not include Swedish iron, Russian sheet iron, charcoal iron for carwheels, nor any manufactures of iron as nuts and bolts, small iron less than 1/2-inch diameter, cast-iron pipe, etc., or any other implements. So we are importing yearly about 38,000 tons into the province of Ontario alone (leaving out 4,307 tons of steel) every pound of which ought to be, and can be manufactured profitably in Toronto, and our mine owners are meanwhile with laudable energy endeavouring to push the sale of Canadian iron ores in the United States, or in other words, trying to sell the hide for sixpence in order that we may be able to buy back the tail for a shilling. It is a long lane that has no turning, and we may hope that this state of affairs will soon end. One of the greatest objections to the establishment of a blast furnace has been removed, that is, the want of a market for its product. The figures given above show that the Province of Ontario alone would consume the output of two fair-sized furnaces, and the supply would increase the demand, for a furnace located in Toronto could afford to sell iron \$4 per ton under present market prices and yet have a handsome profit for the owners. Another objection is in a fair way of being removed, or rather I should say, its fallacy is being publicly demonstrated, that is the want of sufficient ore for the purpose, by evidence now coming forward that cannot be set aside showing that our iron deposits are second to none on the continent. The results of the borings with the diamond drill at the Bedford mines, north of Kingston, have proved the existence of large bodies of ore just as it had been previously predicted by competent geologists, and I am confident that similar results will be met with at many more of our mining locations. I have to-day received a letter from that district, stating that "there is sufficient confidence in the supply of ore in sight in these mines to induce the company to enter into a large contract if a good order could be had." The third and last objection can also be met successfully—it is the absence, or supposed absence of fuel. A glance at my railroad map of Canada and the States is sufficient to show that Toronto is much nearer to the coal fields in the States than is Chicago, where the most successful furnaces in the United States are located; and to-day coke from Cornellsville could be laid down for furnace use in Toronto for less than \$4 per ton duty paid; and in the event of an enterprise of this kind being set on foot, it would surely not be too much to ask a rebate of this duty in part or altogether.

The following figures give the outside cost of manufacture of pig iron in Toronto.

1 ton of coke at, say \$4.10.....	\$ 4 10
1 1/4-ton of ore, at \$3.50.....	6 30
Lime for fluxing (not more than).....	0 50
Labor, office expenses, etc.....	2 00
Interest on \$150,000 capital at 6 per cent., calculated on an output of 21,000 tons per year.....	0 44
Total per ton.....	\$13 34

I have taken the coke at \$4.10 or 25 cents above actual prices now ruling for furnace coke.

SOME EXAMPLES OF PLANING MILL PRACTICE.

IN one of the planing mills I ran at one time, says a correspondent of the *Manufacturers' Gazette*, I found a resaw that had a bad habit of burning out the box next to the saw collar. That is to say, burnt out that part next to and for an inch from the fast collar on the saw mandrel. The foreman of this mill evidently thought water was cheaper than oil, so he built a platform up on the frame of the shafting, put two barrels on it, connected them with a piece of $\frac{1}{2}$ -inch pipe and from the lowest barrel he run another pipe down to the saw frame, and turned the stream into the bearing with an elbow having a globe valve to regulate the flow of water. There is no question but what that stopped the heating, but let's see what else it did.

The blower pipe took the sawdust from directly under the saw, leaving the place clean, and all parts of the machine and gearing accessible at all times. The water, dripping from the bearing at the rate of two barrels a day, soaked the sawdust, and clogging the pipe, made the blower inoperative. The dust had to go somewhere, so it piled up around the saw, and required the work of a boy to keep it moved over to a larger pipe.

About this time the foreman left and I took charge. Not being a believer in the cold water treatment, I made a change in the then existing arrangements. First I took down the barrels and connections and sent them down to the mill shop for better use. Likewise I took down the platform, for convenience and appearance's sake. Next I took out the saw mandrel and found it sprung near the collar; very slightly, but enough to bind when the caps were down. To remedy this I put it in the lathe and turned off the merest shaving, just enough to take out a lump caused by the sprung place, put it back and screwed down the caps, shipped up my belts, filled the oil boxes with clean waste and oil and started off, and that box never got warm up to the time I left, covering a period of four months, and being in everyday use, and using one pint of oil per day for the whole machine. This saw was running 2,250 a minute on a 90-foot feed, cutting six-inch pine.

Many years ago I was an office boy at a planing mill where business was good and money more plentiful than it is now. The boss, as I can well remember, was one of those men who are always trying to stop the little leak at the spigot, no matter if the barrel was running over at the bung-hole. Many a day I have seen a boy (at \$1 a day) standing with bucket and can pouring water on hot bearings, when a few pounds of habbit, an hours' work at the lathe and a little oil now and then would have saved the expense of the boy and the annoyance of the water.

This planing mill is to-day a broken-down remnant, no business and no money to run it, a warning to others against such methods. The policy that run the machinery was pursued throughout all branches of the business, and now the business, boiler, engine, shafting and machines are in chaos, and from a force of 12 men and three clerks, has dwindled down to one man and no clerk at all.

Here was a man who wanted his foreman to save as much repair as possible, cut down expenses and use water for oil. In fact, he stretched his blanket until it burst, in ways like the following: One of the planers was a three-side surfacer and matcher for stuff up to 3x12 inches. One order for decking came in for six pieces 3 $\frac{1}{2}$ x6 $\frac{1}{2}$ finish, three sides dressed with square edges. In vain the foreman protested that the machine could not take in the 3 $\frac{1}{2}$ x7 to which the stuff was sawed. About a minute's argument served to get the boss's mad up, and he quoted scripture until the air was murky, and the upshot of it all was that Mr. Foreman had to make that machine do what it was too small to do, or quit.

Now was the foreman's time to get mad, and he swore he would dress that stuff or break the machine to atoms. "If I am to get fired, I may as well give him cause," was the remark he made as he started to work. Stretching the planer to its utmost limit of cylinder and feed rolls and taking the weights off the levers and tying them underneath to give the levers a chance to go up higher under the frame, he went to the engine and tied a big nut on the governor arm and started up. I well remember how she hummed, making about 6,000 per minute.

Motioning to the feeder to start in a piece, the forman moved for the engine and I moved for the street, and just got to the door when the machine started cutting. Between the terrific speed and heavy cut, and lack of strength at the extreme end of the slides that held the cylinder boxes, the cylinder broke loose, boxes and all, and cut down the mill like a young cyclone. Nobody hurt, but \$60 damage to the machine, and three weeks of

its service lost to the shop. All this to save \$1.75 that a neighboring mill asked to do the work on their sizer. Moral—Don't bite off more than you can "chaw," even if the boss does tell you to do so.

It was at this mill that I saw a thing done that is well worth knowing. On the sugar landing were several elevators used for taking hogsheds of sugar from the boats up to the wharf. The cross pieces of those elevators, pieces that correspond to buckets in a grain elevator, were found to be too thick and were to be dressed down from 3 $\frac{1}{2}$ x4 inches to 2 $\frac{1}{2}$ x4 inches. As they were only 20 inches long, and concave on one face and bevelled and mortised on the other, it was a job entirely beyond the reach of two other mills that tried it and our foreman took the job in hand and was laughed at for his temerity. The difficulty lay in the fact that there was no flat surface on one side, and the mortises and bevels on the other gave no chance for a continuous feed.

By measuring, he found that the first bevel was four inches long, and then four inches of flat surface and then a four-inch mortise, the flat surfaces alternating each bevel and mortise. Taking a piece of 3 $\frac{1}{2}$ x12 surfaced pine, 20 feet long, he nailed a strip 1x1 $\frac{1}{2}$ along each face edge, making a trough nine inches wide; nailing a block at the end for a chock, he put the first piece on one side of this trough up to this block, and the next piece alongside of the first, but four inches further back. This made up a continuous surface by the pressure alternating from one piece to the other, with a stick of the same thickness to shove out the last piece. The 600 pieces were thus dressed in two hours, for which the owners paid ten cents each, or \$60 for two hours' work on one machine with two men.

ENGINE FOUNDATIONS.

THERE is not a detail in engine construction and operation that merits greater consideration, or is of greater importance to the successful working of an engine, says the *American Engineer*, than the foundation upon which it stands, and too much care cannot be accorded it, that it shall have ample spread, stiffness, unity and adaptability to the movements and operation of the parts which it supports. It should be so bonded and tied that unequal settlement shall not take place, and the height, weight and place should be of such proportion that when the engine is in full operation there shall be no swaying or twisting of the parts, no heating of journals, no springing or tremor of the bed arising from an unsuccessful transmission of the strains. The higher the speed and revolution the stiffer and more solid should be the foundation, and the greater the base contact with the supporting earth. A good foundation will often decrease the defects of a poor bed, provided, of course, that such engine bed be properly and thoroughly bolted to its foundation. When properly constructed and tied together, the engine bed and its foundation should be portions of one complete whole, inseparable and undisturbed in their relationship by the movements of the engine parts while at their hardest work.

A good bottom of concrete of smooth upper surface laid upon a rock or solid earth bottom, upon which the main structure of brick is laid close and jointed with first quality of cement, and the whole capped with one or more large blocks of stone jointed and placed to suit the engine bed, and to distribute the weight over as great an area as possible, constitutes the best foundation. Above the concrete bottom may be all of stone, and the larger the stones the better.

Ordinary rubble work is not to be relied upon, the only capacity for retaining and uniting the structure as a whole being contained in the cement. The irregular shape of the stones forming the rubble masonry present, through their lack of contact with each other, rather a precarious and unreliable bond, and the cement is too thinly laid to fix them permanently in their position, in spite of the thrust and twist of engine operation. It is far better to mould a complete foundation of concrete, capping it, if possible, with the thick solid blocks already mentioned in connection with the brick foundations. The foundation frame or bed may be placed in position and lined up, and the joints filled and packed with melted sulphur.

The actual nature of the soil or bottom upon which the engine and foundation is to rest, whether it be wet, soft and elastic, whether it be dry, sandy and solid, or whether it be a rock bottom, to which the bed might be immediately fastened with a mere leveling foundation between, determines the nature, extent and scope of the foundation, while the size, weight and power of the engine determines its weight and bulk to prevent vibration or tremor.

CARE OF CIRCULAR SAWS.

TEN years ago says a correspondent of the *Min. Valley Lumberman*, a mill owner would discharge one of his employes that attempted to straighten his mill saws. Since then steam feed and fast motion have been introduced and the capacity of circular saws has been doubled. Circular saws are now run at a motion and feed that requires all the science and skill of the steel maker and saw maker to produce steel and make saws to stand this test. They have done so, if the mill owner will follow the instructions of the manufacturers. But they do not. Some jack of all trades steps into the mill and professes to know all about saws, and advises the owner, or filer, to have him "pound" them. He is allowed to do so without furnishing any more evidence of his qualifications to do the work than he could preach. Why is it that while in any other department of work about a mill, he demands some evidence of his qualifications either as a foreman, sawyer, engineer, filer or any position of responsibility, none is required too often when it comes to taking care of the saws? How often these traveling quacks agree to learn any man of ordinary intelligence the science of "pounding" saws for the small sum of fifty or one hundred dollars! You can safely count him a fraud and a humbug. Would you listen to such a proposition to make you an engineer or any other mechanic on short notice? Would you intrust the repairs of a valuable watch to such a man? The writer has manufactured and repaired saws for 22 years in the largest manufactories in this country, and his observation has been that about one in six who start to learn the trade ever succeed. It requires patience and perseverance to accomplish it. More than one-half of the saws condemned in mills have been from the fact that they have not had the proper tension. In every large lumber centre there are one or more competent saw makers who can properly hammer and straighten saws do justice to all makes of saws and guarantee their work satisfactory. They can furnish ample evidence that they have served a regular apprenticeship at the trade. Never let a novice "monkey" with your saws, engine or any other part of your mill. You can expend \$50,000 in a good mill but your success depends largely on your saws and their care.

THE ELECTRIC BATTERY.

IT is as absurd to talk of getting electricity for nothing as it is to talk of getting heat or steam-power for nothing. Electricity is a form of energy, and, in order to produce it, at least as much energy must be expended in one form or another. In the dynamo machine mechanical energy is transformed into electrical energy; in the furnace, potential energy in the coal is transformed by chemical combination with the air into energy in the form of heat: in the battery, potential energy in zinc is transformed by chemical combination with the liquid into electrical energy in the form of current. The two latter reactions are identical, though the subsequent forms which the energy takes are different. The battery is neither more nor less than a little furnace, in which some substance (usually zinc) is burnt up by uniting with the liquid (usually sulphuric acid), just as coal is burnt up by uniting with the oxygen of the air; electricity is produced in one case, heat in the other. That zinc is a fuel, and a good one, may be seen by taking a strip of zinc-foil and lighting the end, when it will burn with a bright blue flame, giving out at the same time more heat than its equivalent of coal. It will not burn in a fire, simply because it melts and runs through the grate before reaching the temperature at which it takes fire.—*Cassel's Technical Educator.*

SOMETHING NEW IN HYDRAULICS.

A great artesian well which spouts up in the ground of the Ponce de Leon Hotel at St. Augustine, Fla. Directly over the well, which throws a solid column of water 12 inches in diameter thirty-five feet into the air, a huge turbine wheel has been placed. Bolted directly to the shaft of this wheel is an Edison dynamo, capable of supplying 375 16-candle lamps have been placed on the walls of the building over the well, and together with the indicating and regulating apparatus connected with the dynamo. The trials in generating electricity in this way by power derived directly from the earth have proved eminently satisfactory as far as the steadiness and constancy of the light are concerned. Hydraulic experts throughout the country have condemned this scheme as impracticable, and have doubted the constancy of the flow of water from the artesian. This, however, in three months has not perceptibly diminished. The experiment is interesting as being the first case on record where natural water power for driving machinery has been derived directly from the earth.

LONDON MACHINE TOOL CO.,

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Machinist--and--Brass--Finishers'--Tools.

L. A. MORRISON, with A. R. WILLIAMS, General Agents, TORONTO, ONT.

THE DOMINION CHUCK AND TOOL WORKS

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Combination, Universal and Independent

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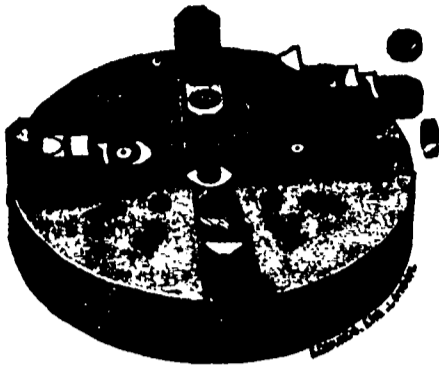
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Of New and Improved Design.

Trade liberally dealt with. Catalogue out shortly. Prices on application.

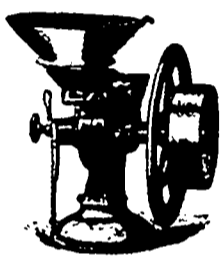
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GRINDS all kinds of Grain equal to any pair of French Burr Mill stones, or any Roller Mill for the reduction of wheat to flour, or for fine corn to table meal, or corn and cobs to feed meal. Send for particulars.

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Preferred by mill experts as the VERY BEST.

Was selected for driving the large Keswatin Mill.

Will grind with Rolls over 2 bbls. tabled H. P.

E. P. CAVE, ROLLER MILL BUILDER, THISTLETON, ONT., writes:

"She is a daisy;" and "I will not fail to recommend it to any in one want of a Water Wheel."

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CHAMPION FIRE & BURGLAR PROOF SAFES.

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CHAMPION STUMP AND STONE EXTRACTOR.

Over 2400 in use and 6 years' trial have proved this to be the machine for clearing land. Send for circular of either of the above to the inventor and manufacturer, S. S. KIMBALL, P.O. Box 945, Salesroom 577 Craig St., MONTREAL.



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FOR MERCHANT AND CUSTOM MILLS.

In our Short System of milling we are using new and improved methods of bolting and purifying which are our own inventions.

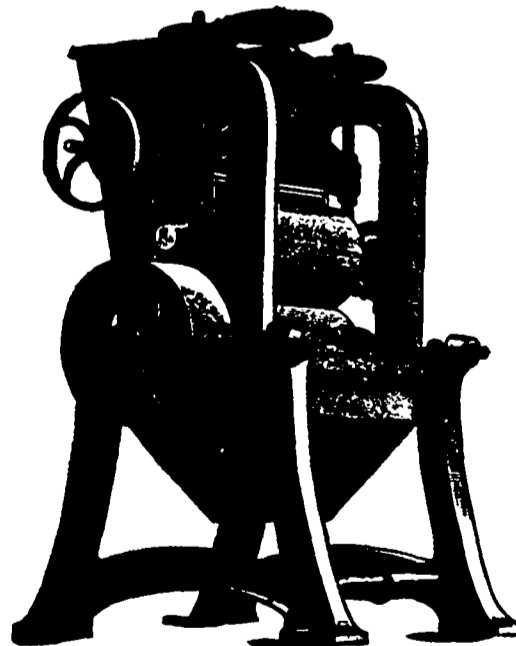
Our Purifier and Aspirator combined is the best machine we know of for the proper handling of middlings.

The middlings are graded before the blast is applied to them, each grade treated separately on the same machine.

Our Bolting and Scalping Reels are round, running at a slow motion, the cloth being covered the whole length of the reel, no matter how slow the bolt is fed. This we consider one of the most important points in the manufacture of flour.

Old style reels can be changed to this same principle, producing the same results.

Millers who desire to improve their flour would do well to look into the merits of these machines before purchasing.



JONES' SHORT SYSTEM FOR CUSTOM MILLS.

Is the simplest and best in the market. The results are equal to any long system, and the cost less. Grist can be ground as brought in if desired, and can be handled as conveniently as if ground in mill stones. One Roller Disc machine, two corrugated rolls, one smooth roll one stone roll, one bran duster, two flour-dressers and one purifier, with proper cleaning machinery and elevators, is all the machinery necessary in this system to make a straight grade of flour equal to the straight grades made in any long system.

CAPACITY—50 Barrels per Day from Fall Wheat.

TESTIMONIAL

IN FAVOR OF THE SHORT SYSTEM, USING FIVE SINGLE ROLLS TO COMPLETE THE WORK.

ABINGDON, September 18th, 1887

JAMES JONES, ESQ., Thorold, Ont.

Dear Sir: Our mill has now been run long enough to give us an opportunity to test it thoroughly, and we are satisfied with it. The yield and quality are excellent. It takes all the flour out of the wheat, and for capacity, instead of making sixty (60) barrels, as the contract called for, we are running from 85 to 100 barrels, and clean it up in good shape. The stone roll, on which nearly all the best flour is made, works with less attention than any other machine in the mill, and does its work well. We feel ourselves indebted to you for the prompt manner in which you carried out your contract.

Yours truly,

R. A. SHEPHERD.

For further particulars, apply to **JAMES JONES & SON, THOROLD, ONT.**

THE "ELDRED MILL, JR."

THIS is the name of a model 50 barrel mill which has been constructed for exhibition purposes by the Geo. T. Smith Middlings Purifier Co., of Jackson, Mich., and which will be in operation at Buffalo during the meeting of the Millers' National Association a few days hence. The following description of this unique production is taken from the Jackson, Mich., *Citizen* of the 23rd ult.:—"The 'Eldred Mill, jr' is 27x23 feet in dimensions and three full stories above a high basement, surmounted by an attractive mansard roof, the top of which is forty-seven feet above the pavement. The framework is made wholly of dressed and polished Georgia pine, bolted together in sections and so ingeniously contrived that every bolt is hidden, yet the structure is as firm and strong as a granite rock. The outer surface is covered with the finest galvanized iron and the roof is of the same, but artistically molded in the mansard style. The iron walls are broken with numerous windows on every story, filled with double sash of cherry wood and heavy plate-glass. The walls are handsomely painted and penciled in exact imitation of red brick with brown stone window trimmings. Inside the iron wall is a sheeting of fire-proof asbestos separating it from the ornamental wood-work of the interior, which is as elaborate and artistic as the finest railway coach, with panels of highly polished cherry, walnut and ash casings, filled in with red oak, white-wood, birch, etc., carved, turned and moulded in the finest style of the cabinet-maker. The doors are of similar construction, the mouldings of the rarest hardwoods, and the floors are laid in narrow strips of hard pine.

"In the arrangement of the machinery space is admirably economized, leaving room for two complete flights of stairs from every floor. In the first or main storey above the basement are located six double roller mills manufactured by the Nordyke & Marmon Co., of Indianapolis, Ind., and the Todds & Stanley Mill Furnishing Co., of St. Louis, Mo. From these the product passes to the basement where it is caught in elevators and carried up to the floors above. On the second floor are three Geo. T. Smith purifiers, two Richmond brandusters and one germ aspirator with dust-collector attached, and in the third storey 12 Geo. T. Smith bolting reels and scalpers. All machines manufactured by the Geo. T. Smith Middlings Purifier Co. are the very best that art can devise. The wheat-cleaning machinery, which is located in the elevator building, consists of one No. 0 Richmond milling separator, one No. 1 Richmond horizontal scourer, one No. 2 Cranson, Huntley & Co. scourer and one Hodge & Howell cockle-machine. The flour-packers and scales are also in the elevator building and consist of two Richmond City Mill Works flour-packers, one flour scale manufactured by the Buffalo Scale Co. and one Fairbanks hopper and scale. The mill and elevator will be driven by a 30-horse-power Kimble engine, manufactured by the Kimble Engine Co., of Comstock, Mich., and which in its way is quite as noticeable as the mill, having neither cylinder, piston-rod, cross-head nor ways. All the machines manufactured by other houses than the purifier Co. were made especially for this mill and are intended to correspond in finish with the machinery built by the Purifier Co. and the mill building. Outside of the mill is the grain elevator referred to above, somewhat similar in size and built on the same general plan, fire-proof, and with storage for 1,500 bushels of wheat. Both buildings are fitted with a great number of incandescent electric lights, which are supplied by the Jenney Electric Light Company, and when in operation will render the building as light as day.

"The mill and elevator are built in sections on which much ingenuity has been expended, and can be taken apart and packed in cars about as rapidly as theatre stage scenery. They are easily transferred on three ordinary freight cars. The total weight of the mill proper is 44,000 pounds. The machinery is now nearly all in place, and after it has been tested the mill will be taken down and shipped to Buffalo, N. Y., about the first of June and there erected on a lot adjacent to the Music Hall, where the National Millers' Association hold their annual session. It will be operated there to show the assembled millers the working of a perfect mill, and if they fail to admire it they must be stoics, without appreciation of the beautiful, for nothing half so fine was exhibited at the Centennial Exposition in Philadelphia in 1876. From Buffalo the model mill will be removed to Cincinnati and erected on the Exposition grounds, where it will remain three months in constant operation, grinding fifty barrels a day and selling the flour in Cincinnati, for which purpose a handsome delivery wagon will be run and an office will be kept open in connection with the mill. Ushers will also be in constant attendance to show visitors through the mill and explain its

points of interest and excellence. The finest lady need have no fear of soiling her clothing, for the model mill will be kept as clean as a parlor. Next season it is Mr. Smith's intention to send this model mill to Paris, France, where it will be exhibited and operated on the same plan as at Cincinnati, and after that it will be taken to South America for a season, and thence to Australia, in order that all the world may see the triumph of American ingenuity in mechanics and industrial art."

THE PROGRESSIVE MANUFACTURER.

IT is surprising as we wander about the country, and visit the thousands of establishments, to notice the vast difference in the manner of conducting business by the different concerns.

Go, for instance, into some old and long-established factory or shop, where the proprietor is well along in years, and has been doing a prosperous business from which he has accumulated a goodly portion of this world's wealth, and possibly laid the foundation for the same prosperity in the world to come. You will generally find him an easy-going, comfortable man who cares little for the rush and bustle of a business life of to-day. He has made his money, and is even now getting a fair living from the plant.

Look about the shop or factory, and you will find the same easy-going, still, plodding style. No new improvements or facilities for turning out work upon the plan of later date. It is the same old shop that it was when its proprietor started in life, and no amount of talk or reasoning could induce him to "fit up" and run the plant with the push and vim of his youthful neighbor.

He is years behind the times, and still plods on, taking everything easy, worrying about nothing, and undisturbed by the vexations of competition, market prices or the numerous other things that keep the younger and more vivacious characters in a constant flurry. This was the plan upon which business was done in the years gone by, where there was less competition, and in consequence more of a demand for the productions in the country, and it was not necessary to watch for every new and approved appliance with which to equip the shop and facilitate production.

Visit another shop in which the proprietors are young and struggling for an existence and patronage.

Here you find everything in the way of modern appliances for the rapid and economical production of goods. Everything is done on the principle of modern Yankeeism. Every one, from the foreman to the apprentice, is rushing around wide awake, and always in a hurry. There is no time to take things easy. Competition in production and prices necessitates that every man do his best, aided by the most approved mechanical appliances that modern science and skill can produce. The proprietors are always busy, full of business, and with no time to take things easy.

This is the plan upon which all business is done to-day. Everything goes with a rush, and in order to stand anywhere, a man must enter and "go-as-you-please," or get left and find himself behind the times, and his business unprofitable and slow-going.

The progressive manufacturer of to-day is the one who keeps up with the times in every respect. Competition caused by the multiplication of production and improved machinery has changed the method necessary to a successful business.

There is another thing very noticeable in these visits. This is the idea that many men have of the necessity of constant addition and necessary repairs. In the grand rush not enough care is taken of the plant itself. Shafting and machinery are put up, and beyond an occasional oiling receive no further attention unless a break or failure to work makes it absolutely necessary.

In every large shop the time of one man whose sole business it is to look after these things will be rapid in the long run in many ways. There are few shops or factories where large, heavy machinery is used but in which too little attention is given to the loss of time and power through neglect of proper attention to the shafting required to run it. This has been partially overcome by modern improvements in boxes and hangers, but we are led to believe from what we have observed that much power is wasted through imperfect adjustment of hangers, and even in many cases the proprietors, aware that something is wrong, are unable to locate the trouble. Oil is poured on to a bearing that has become warped, or out of place, or heats, and is still kept running in this manner, while it would be both a saving of time, power and material to have it put right and kept so.

Help are employed who are incapable of understanding the mechanism they attempt to run; they have no interest beyond the fact that they are turning out work

Something goes wrong, and they twist and yank until disgusted, and then call on the helper to do the necessary repairs. Such things are not in accordance with progressive ideas. Machinery costs money, and requires care and attention to keep in good working order, and the man or concern who will be the most successful will not neglect to respect the health, so to speak, of the machinery that helps to make his business a success.—*Manufacturers' Gazette.*

TRANSMISSION OF POWER BY CABLE.

FOR the first time in America the principle of the cable is used in street railways, applied to the transmission of power to machinery in widely separated parts of a building was tested recently at the Union Steamboat Company's warehouse on Market street, Chicago, with the most satisfactory results. The cable used was a manila rope seven-eighths of an inch thick and 750 feet long. The rope went round the driving wheel and winding sheaves three times, and then was carried 150 feet north on twelve inch pulleys of the same pattern as with the North Side street car cable. There is furnished power to a moving incline, and then was carried 200 feet south and hence eastward seventy-five feet, where it drove a barrel-lift, and then returned to the driving wheel, where it moved a second incline. The slack in the rope was taken up by a sliding wheel on the same principal as in the street car cable. The driving wheels had V-shaped grooves in which the rope was pinched and prevented from slipping. The cable was tested running at the rate of 1,600 feet a minute. It was found that about five-horse power was taken up in driving the machinery when not loaded. The engine is forty-horse power, which gives ample power for the work. T. S. Miller was the inventor of the plan.—*American Engineer.*

PERSONAL.

Wm. Ellis had two fingers cut off in Shure's mill, at Bracebridge, Ont., a few days ago.

Mr. Walter Scott has assumed the management of the new Keewatin flouring mills.

Mr. L. McKinnon has removed from Alton, Ont., to take charge of a roller mill at Lynn, Ont.

Mr. Oluf Tyberg, draughtsman at the Canadian Tool Works, Dundas, Ont., has gone to Philadelphia, Pa.

John Ogilvie, of the Ogilvie Milling Co., Winnipeg, and family, have been paying a visit to British Columbia.

The many friends of Hon. T. B. Pardee, Commissioner of Crown Lands for Ontario, will regret to learn that his health is still very imperfect.

Major McMillan, the well-known Winnipeg miller, has been nominated by the Liberals of Centre Winnipeg as a representative for the Local Legislature.

At a meeting of the Dunfrie Foundry Benefit Society, Galt, Ontario, a resolution of condolence was passed with the family of a late member Mr. John J. Shaine.

Mr. Samuel H. Campbell, of Buffalo, N. Y., has reached Dundas, Ont., where he will take the position of foreman of the iron works department of the Cochran mills.

A London paper states that in case Mr. Pardee's health should necessitate his withdrawal from office, his successor will probably be Mr. Gilson, M. P. P., of Hamilton.

Mr. Henry Bracken, miller, of Boston Mill, Ont., has been unanimously selected by the Liberals of Cardwell as their representative in the approaching Parliamentary contest.

A party consisting of Mr. John Goldie, Miss B. Goldie, Alex. Goldie, Galt, Mr. and Mrs. David Goldie and children, Ayr, Ont., left for Great Britain a few days ago.

D. H. Gilbert, Manager of the St. Thomas Car Wheel Company's foundry, has resigned to accept a position in Montreal as superintendent of the Montreal Car Wheel works.

Thomas C. Ide, book-keeper for Messrs. McKee & Warwick, machinists, Petrolia, Ont., is reported to have absconded, taking away with him \$150 belonging to his employers.

Wm. C. Noxon, son of James Noxon, General Manager of the Patterson Bros' works, Woodstock, has received an appointment in the Provincial Treasury Department, Toronto.

Mr. C. M. Palmer, the enterprising publisher of the *Northwestern Miller* has purchased an interest in the *Daily Minneapolis Tribune*. He will still retain the ownership of the *Miller*.

Thomas Hall, of Brantford, Ont., who was at one time foreman of the Waterous Company's works in that city, committed suicide by hanging, on the 24th of May. He was of unsound mind.

Millwright James Sibley, of this city, has engaged with the Stillwell & Bierce Co., of Dayton, Ohio, to assist in the work of overhauling Schweikopf & Matthews' mill on the American side at Niagara Falls.

Mr. C. H. Waterous, the President of the Waterous Engine Works Company, Brantford, and Mrs. Waterous have returned home from an extended tour, covering the winter months, in California and other States.

Mr. John H. Flemming, recently Superintendent of the New York Car Wheel Works, Buffalo, and for many years connected with the Griffin Car Wheel Co., of Detroit, will act as Superintendent of the St. Thomas Car Wheel Works.

Wm. Motley, head millwright in the Ogilvie mill at Winnipeg, was seriously injured on the 17th May. While superintending the erection of a centrifugal separator, the tackle gave way allowing the machine to fall over on him. A rib and collar bone were broken, and he also received serious internal injuries.

Wm. Matley, head millwright at the Ogilvie mill, Winnipeg, while superintending the work of erecting a centrifugal separator, was probably fatally injured by the tackle giving way and allowing the machine to fall over on him. One rib and his collar bone were broken, and he also received serious internal injuries.



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Our method of procuring for our subscribers the most reliable information is through Solicitors of the highest standing, and from other equally reliable sources in the several localities indicated, who are under contract with us to supply the necessary information promptly.

The Landed Enquiry Department of this Agency, the only institution of the kind known, is invaluable to Solicitors, Loan, Investment, and Insurance Companies, Estate Agents, and others, preventing fraudulent land transactions resulting from misrepresentations.

The Department for the collection of outstanding accounts is conducted on an entire change of the system usually followed by Collecting Agencies, viz:—Subscribers may have their collections paid either direct to themselves, or to the offices of the Agency, in which latter case remittances will be deposited to an account provided for that purpose, and immediately remitted to the parties to whom it is due, and will not be applied to any other purpose.

Another important feature in connection with this Department is, that subscribers depositing accounts for collection will, if requested, be furnished with a Form of Receipt, on which will be entered the name of each debtor, the amount owing, and a full report of the prospects of collection, and providing that the receipts thereof be paid to bearer only, thus enabling subscribers to realize on their outstanding accounts.

The Agency will forward at least once in three months, or oftener if desired, a report and statement of all accounts in hand.

NOTE.—The offices of the Agency are open to the Solicitors and subscribers for reference to our numerous maps, atlases, directories, and correspondence, and for the transaction of business with their clients and customers when in Toronto.

W. SMITH, Manager.

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 Designs, Plans and Specifications prepared for all class of buildings. Tenders obtained, and buildings superintended in any part of the province. Having had a large experience in the construction of Grain Elevators and Mills, we are in a position to supply working plans, etc., for these buildings, and the necessary machinery for any capacity on the shortest notice. Correspondence solicited. No charge for preliminary design.
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OBJECTS.
 To prevent by all possible means the occurrence of avoidable fires.
 To obviate heavy losses from the fires that are unavoidable by the nature of the work done in mills and factories.
 To reduce the cost of the insurance to the lowest point consistent with the safe conduct of the business.

The Combined Losses and Expenses on the business of 1887 was under Fifty per cent. (50%)



NOTICE.

SEALED TENDERS, addressed to the undersigned, and endorsed "Tender for Indian Supplies," will be received at this office up to noon of **THURSDAY, 7th June, 1888**, for the delivery of Indian Supplies during the fiscal year ending 20th June, 1889, consisting of Flour, Bacon, Groceries, Ammunition, Twine, Oxen, Cows, Bulls, Agricultural Implements, Tools, &c., duty paid, at various points in Manitoba and the North-West Territories.

Forms of tender containing full particulars relative to the Supplies required, dates of delivery, &c., may be had by applying to the undersigned, or to the Indian Commissioner at Regina or to the Indian Office, Winnipeg.

Parties may tender for each description of goods (or for any portion of each description of goods) separately or for all the goods called for in the

Schedules, and the department reserves to itself the right to reject the whole or any part of a tender.

Each tender must be accompanied by an accepted Cheque in favor of the Superintendent General of Indian Affairs on a Canadian Bank, for at least five per cent of the amount of the tender, which will be forfeited if the party tendering declines to enter into a contract based on such tender when called upon to do so, or if he fails to complete the work contracted for. If the tender be not accepted, the cheque will be returned.

Each tender must, in addition to the signature of the tenderer, be signed by two sureties acceptable to the Department for the proper performance of the contract.

The lowest or any tender not necessarily accepted.

This advertisement is not to be inserted by any newspaper without the authority of the Queen's Printer, and no claim for payment by any newspaper not having had such authority will be admitted.

L. VANKOUGHNET,
 Deputy of the Superintendent General of Indian Affairs.

Department of Indian Affairs,
 Ottawa, May, 1888.



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Time saved and profanity sensibly diminished in every mill, store and barn where the "DANDY" PATENT BAGHOLDER goes into use. It will last a lifetime and only costs 75 cents. Sold through agents. Sample (free by express) on receipt of price.

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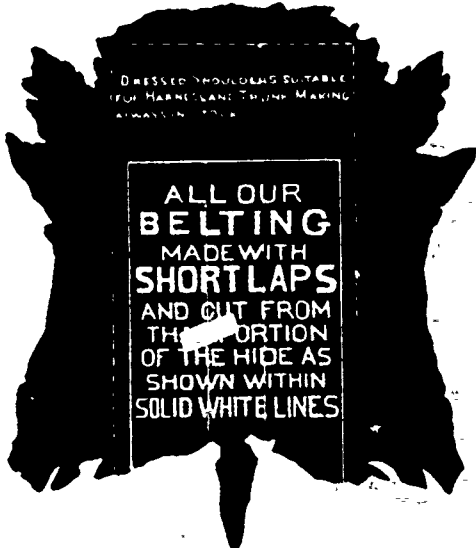
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All our Goods are manufactured by the "Simonds" process. Our Circular Saws are unequalled. We manufacture the Genuine HANLAN, LANCE TOOTH, DIAMOND, NEW IMPROVED CHAMPION, and all other kinds of cross-cut saws. Our Hand Saws are the best in the market, and as cheap as the cheapest.

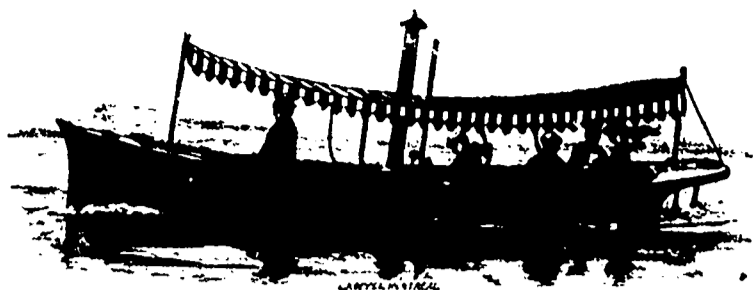
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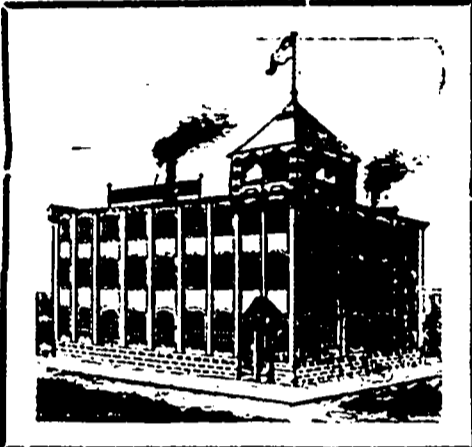


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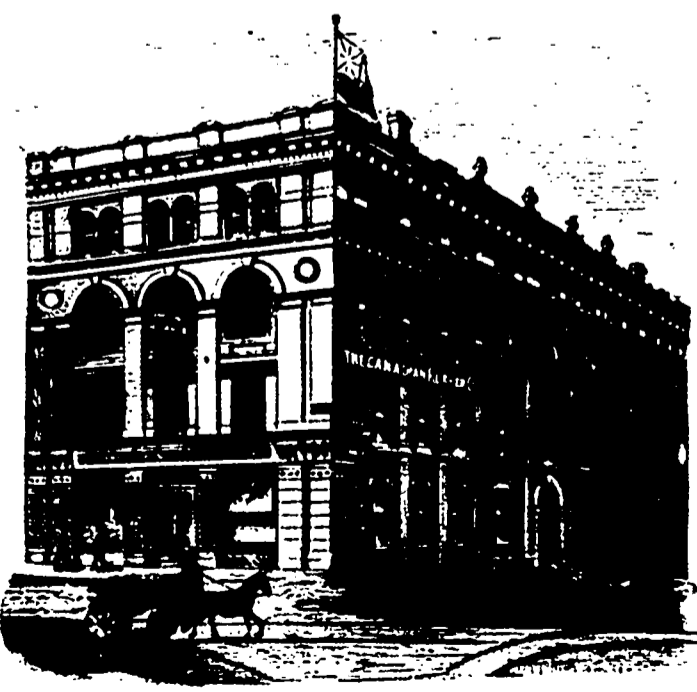
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