

DOMINION MECHANICAL & MILLING NEWS

DEVOTED ESPECIALLY TO THE INTERESTS OF OWNERS AND OPERATORS OF

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

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PUMPING SOLVENTS INTO BOILERS.

In the July number of the *Locomotive* was an illustrated article showing how to attach an apparatus to a boiler. While that apparatus is very complete and effective, it may sometimes be inconvenient to make

the attachment, owing to the location of the pump. We show in the illustration (Fig. 1) an easy and inexpensive manner of accomplishing the same result. It consists in putting a T in the supply pipe near its connection with the pump. A stop valve is to be placed in the supply pipe a little below the T connection, and another stop valve is to be placed in the extension of the T connection. On the end of the T connection a hose is attached which runs to the pail or tub containing the solution. When the solution is to be pumped into the boiler, close the stop valve in the suction or supply pipe and open the stop valve in the extension of the T connection. The pump will then draw directly from the vessel containing the solution. When the solution has been pumped into the boiler, close the stop cock in the T extension and open the suction or supply pipe, and the pump will then take water from the general supply

Fig. 2 shows a similar attachment for use in connection with an injector. The illustration is so plain that a description will hardly be necessary. In establishments where the water is of a character to render it necessary to use a solvent, one of these attachments to the pump or injector will be found very useful. In order that the three ways of making the attachment may be before the reader, we reproduce the illustration (Fig. 3), that was used and fully described in the July issue of the *Locomotive*.

FINISH WHAT YOU BEGIN.

THOUSANDS start well, but never finish one thing at a time. They have a dozen things on hand, and no one completed. Time is wasted on unfinished work. Always finish what you begin. One thing finished is worth a hundred half done. The completion of an undertaking yields more pleasure and more profit than dozens of plans. The man who is always planning or scheming is rarely, if ever, successful. He often furnishes ideas for other who go persistently to work and finish what his ideas suggested. "That was my idea in my plans," we frequently hear some one say, but the man who carried it out was the man who benefitted himself and others. Do not begin what you cannot finish. What you undertake to do, do, and reap the reward of your own ideas and skill.

The Railway Council of the Dominion has just passed an Order-in-Council raising the export duty on pine sawlogs from \$2 per 1000 feet, and measure, to \$3 per 1,000.

1888-9.

Opinions of Prominent Canadian Manufacturers on the Condition and Prospects of Trade.

EARLY in November the publisher of the MECHANICAL AND MILLING NEWS addressed enquiries to

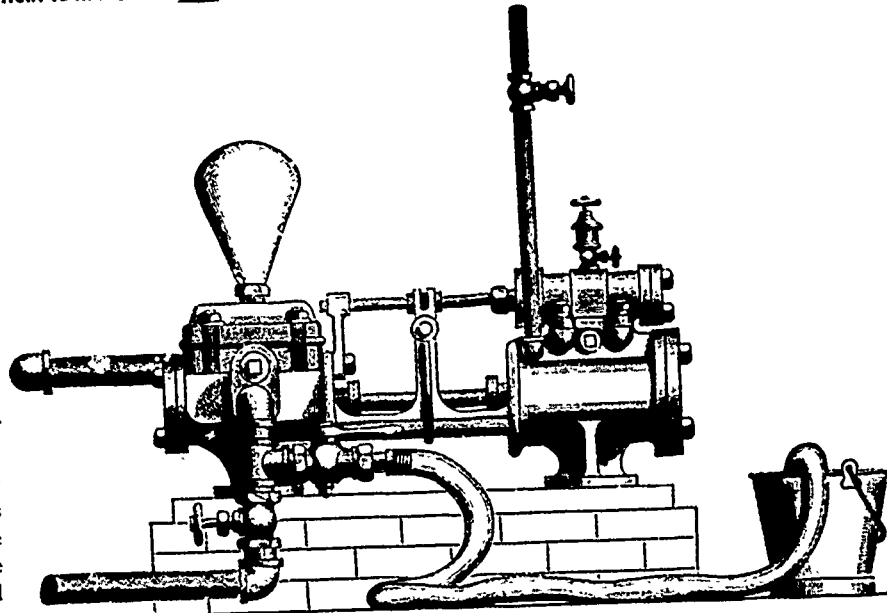


FIG. 1.

the principal machinery manufacturers in Canada with the view of placing before the readers of this journal the volume of business done by manufacturers in 1888, as compared with former years, as well as the business prospects for 1889. The replies which have been received, will be found printed below, and will no doubt be

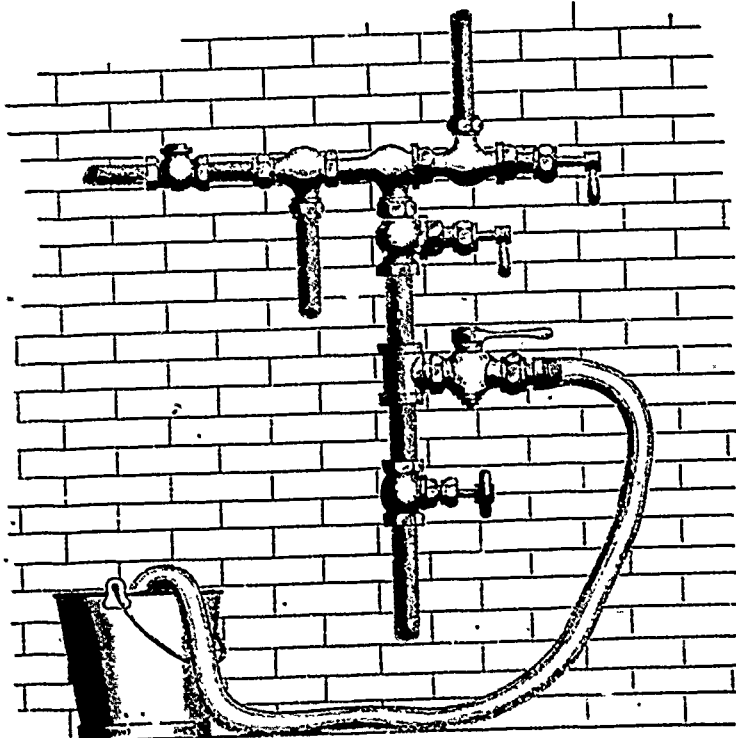


FIG. 2.

read with careful interest:

The Ball Electric Light Co., Toronto, write:

We have your favor of the 1st inst., and in reply, beg to state the following. We are very busy this fall; have been running nights for some weeks. Have done 50 per cent more business this year than last. We have

been manufacturing in Toronto since 1883, and have each year added to our shop room, and facilities for turning out work.

We have always made a specialty of dynamos, electrical machines, and lamps for illuminating streets, stores, factories, etc., using lights of the 2000 c. p.; taking two-thirds of a h. p. each. Quite recently, we have made a new departure, and commenced the manufacture of dynamos, to run lamps of 1000 c. p., nominal, 3 1/2 lamps to the h. p.

We are having good demand for these lights. They are suitable for illuminating small stores, factories, streets of cities, (especially where there are many shade trees) as they can be put closer together than the standard 2000 c. p. lamp, with greater economy, thus securing better distribution.

Late last spring we started to manufacture the incandescent dynamos, for both central station and private installation.

We are selling numbers of these machines, purchasers finding them economical of power and attendance, being perfectly self-regulating for any number of lamps in use.

Our outlook for business this fall and winter is good.

The John Doty Engine Co., Toronto, write:

Regarding the volume of trade done by us during the past year, we would say that it is fully twenty-five per cent. more than any previous year. Prospects for the coming year are good—the mining industries, now being rapidly developed, will make a demand for mining and refining machinery. We are

now engaged in completing contracts for machinery for the following firms:—W. & J. G. Greey—15x36 Reynolds Corliss engine and boiler for Manitoba mills; two Arrington & Sims electric light engines for driving electric lights in new C.P.R. passenger station in Montreal; one Arrington & Sims engine for St. Clair Tunnel Co., Sarnia; one 200 h.p. compound condensing engine for Farrar & Co., Meaford; one marine engine for British America Packing Co., New Westminster, B.C.; one Arrington & Sims engine for Troy Laundry Machine Co., Montreal; one marine engine for H. S. Scadding, Orillia; engine and boiler for R. Thompson & Co., Toronto; engine and boiler for the Ammonia Co., Toronto; engine for Imrie & Graham, Toronto; engine for Murdoch & Stephen, Halifax, N.S.; engine and boiler for A. H. Taylor, Con-

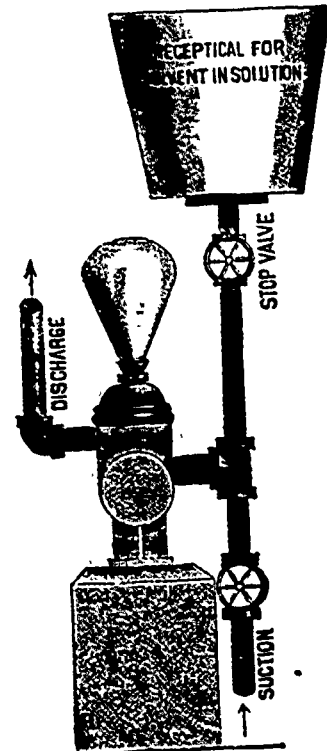


FIG. 3.

con, Ont.; engine for M. B. Burr, Bloomfield, Ont.; engine for F. G. Bresse, Quebec.

Peter Hay (Machine Knife Works,) Galt, Ont., writes: Have been as busy during 1888 as any former year; have added new grinding shops and engine to plant, and

anticipate a fair measure of success during the incoming year from present indications.

The Gutta Percha & Rubber M'fg. Co., Toronto, write :

Replying to your enquiry of the 1st inst., we beg to state that in our opinion the outlook for business generally is very satisfactory ; certainly far more so than last year. Trade with us this last year has exceeded our expectations, and the year that is now ending has been a very satisfactory one. Collections are far better than a year ago, favors have been few, and there seems to be a slight tendency towards shorter credits, which in our opinion is a phase of business to be earnestly cultivated.

As to improvements, the year now closing has seen many in our business, and there is hardly a branch of our business with which we shall not enter the coming year with continued and material improvement. We are also increasing our facilities and lines of manufacture.

Osborne-Killey, Co. (Mona Iron Works,) Hamilton Ont., write :

Our business has increased during the past two years to about double the value. We make a specialty of high class pumping engines and pumps.

John Bertram & Sons (Iron and Wood Working Machines,) Dundas, Ont., write :

In accordance with your request for information regarding the state of business in our branch of manufacture, we have to state that the year now closing shows a long way the largest output since the works were established. This has resulted from several causes, the principal being our late improvements in all our standard machines, both as regards their design, weight, strength and adaptability to the work desired, and also a more complete system of interchangeable details, thus ensuring more rapid and perfect workmanship, as it is an evident fact that in the face of a protective tariff, all home manufactures must be up to the standard of English and American goods, and as reasonable in price, or the principal object of protection will be defeated. Another cause for the above result, is the additional markets of Manitoba and British Columbia. We have during the year made some radical improvements in our plant and machinery, consisting of large planers, lathes, &c., by which we are prepared to turn out machine tools up to 25 and 30 tons weight, and have also under construction and design, several special machines for various classes of work.

The Dodge Wood Split Pulley Co., Toronto, write :

Your favor of the 1st inst. has been awaiting the return of our Mr. Samuel May for a reply, and as he has just arrived, we will say that our opinion of the present condition of the manufacturing business is, that it is constantly progressing all over the Dominion. While it may be admitted that this year can not altogether be termed a very flourishing one in business generally, we have been receiving numerous orders for our pulleys from all provinces east and west and from all the different industries in the country, and we feel free to say that enterprise and a progressive spirit are not resting in Canada, but rather promise to take great strides all along for some years to come.

Of our business we can only speak in the most gratifying terms. Our success shows us that we have brought an article before the manufacturing public that was actually wanted. Since we began manufacturing the Dodge patent wood split pulley only a little over two years have passed, and already there is scarcely a person using steam, water, or other power, who does not know our pulleys and who will not endorse them as the best in the market in this line, in more than half a dozen respects.

Very soon after we started to manufacture these pulleys, our present quarters proved to be entirely inadequate for the business that promised to follow. We are now building near west Toronto junction a large and commodious factory 250x54 feet, three stories, with an annex 60x80 feet, that will be equipped in first-class manner and completed for occupation with the beginning of the new year, when we will have ample facilities, not only to supply our home trade promptly and on shortest notice, but also to extend our transatlantic relations which offer a field without any other limit than the world.

The Nova Scotia Steel Works New Glasgow, N. S., write :

The Nova Scotia steel works were established in 1882. The paid up capital invested in them is \$200,000, two thirds of which stock is owned by citizens of New Glas-

gow. The works occupy about ten acres of land, the main building is 470x130 feet, covering over 80,000 feet. Extensions are being made to the building which will cover some 25,000 feet additional. In 1884 the shipments from the establishment were 2,270 tons ; when the plant now being put in is completed the works will have a capacity of 12,000 tons, and no difficulty is anticipated in disposing of the increased production. At the present time there are 225 men on the pay list, and this number will be increased to 300 when the additions to the works are completed.

The product of the works consists largely of steel for agricultural implements, together with the usual sizes of merchant's steel, in round, flats, and squares, with angles and special sections. A large quantity of spring steel is also manufactured, besides tramway and pit rails, nail and plough plate, and large quantities of sections.

The Metallic Roofing Co. of Canada, Toronto, write :

In answer to your enquiry as to present condition and prospect of trade with us, we would say that during the past season we have found a serious depression throughout the Dominion in the building trade, more or less marked in different localities, attributable mostly to trade difficulties and light crops. There are probably but few manufacturers of builders supplies that will recognize the present as a year of great prosperity, yet with us there are no serious grounds for complaint, as our output for the past ten months has been over 50 per cent. above that of any former year. We have endeavored to maintain the highest standard for our goods by using only the very best quality of material in their manufacture, and having to compete with the cheap grades of material in the market, our margins have necessarily been small, yet on the whole, considering the volume of business done, the . . . for this year is quite satisfactory.

We have added several pieces of new special machinery that will double our capacity, and have adopted sheet steel for the manufacture of both shingles and siding for the future. Are now putting in machinery to make corrugated sheet steel of an improved pattern adapted specially for siding.

An unusually large number of enquiries are now being received from parties proposing to build the coming year, and as the importance of guarding against fires in the erection of buildings is being more than ever recognized by the general public, and more especially by manufacturers and steam users, we cannot but feel that with judicious management of the business, the outlook for the coming year is fairly hopeful.

Miller Bros. & Mitchell, (Machinists, Millwrights and Engineers,) Montreal, write :

Your favor of Nov. 1st duly received. Our business for the past ten months of 1888 has been the best we have had for years, the output for that period exceeding the total sales of 1887 by over \$150,000. We have made no special change in our works except to put in additional machinery. The prospects for the coming year we consider good.

The Hercules Manufacturing Co., (Grain Cleaning Machinery,) Petrolia, Ont., write :

Replying to your favor of the 1st inst. regarding the development and progress of our business, and business generally, from an exhaustive statement of our business which we have recently gotten out we quote the following :—"In 1887, the second year of our existence, the increase in the volume of our business in wheat sources alone was 2237 per cent. over that of 1886, the year of our advent, and in 1888, (ten months,) our business shows an increase over first year of 363.6 per cent." Our jobbing and other mill machinery work has quadrupled itself during this time.

We have increased the dimensions of our plant to four times its original size, and have added during the past year numerous wood and iron-working machines. It is our intention to add a foundry to our plant very soon, and to double our present capacity, as we find the present facilities inadequate to the demand.

In our opinion that the manufacturing interests of Western Ontario must necessarily increase very rapidly, for our people are gradually becoming awakened to the fact that we can, generally speaking, produce just as good machinery at home as can be produced abroad, and the development and thrift of the country demand the most improved and convenient machines that can be produced ; and with the present advancement in agricultural products, we predict an exceptionally good year in 1889.

So far as our personal knowledge of the present condition of trade is concerned, we feel that the Canadian

manufacturer is at least hovering somewhere within sight of the zenith of prosperity. All the manufacturers and dealers with whom we have occasion to transact business, appear to have about all the trade they can comfortably take care of, and doubtless are enjoying the pangs of prosperity.

The flouring mill interests of this part of Ontario, and from our observations through the medium of the amount of business we do with millers generally all over the Dominion, we think we may include the whole of the Dominion, are in a decidedly prosperous condition. Millers are receiving good prices, and in some cases flattering prices for their productions, and from the low prices which have prevailed during the past several years, it would seem safe to conclude that the present condition of trade will continue and probably grow even much better.

W. Stahlschmidt & Co., (Office, School, Church and Lodge Furniture,) Preston, Ont., write :

Complying with your favor of the 1st inst., we have to say that we are well satisfied with our trade during the year just past. Our export and domestic business increased so rapidly that we were during the summer compelled to replace our 28 h. p. engine with a 70 h. p. Wheelock engine, besides putting in additional machinery. In addition to these improvements, we have put in a steam fire pump with connections for each storey for better protection in case of fire.

Beginning with six men a little over four years ago, our business has steadily increased till we now employ 70 hands. If the past is any criterion of the future, we have no doubt that we shall have all we can do during the next year. Our prospects for a still better export trade are very good, and as far as our home trade is concerned, we have every reason to think we shall have no trouble to hold our own.

We have lately decided to add to our lines the building of first-class counters, and other office and hotel fittings. Among the contracts just awarded to us in this line is the counters for the new buildings of the London & Canadian Loan and Agency Co., corner Bay and King streets, Toronto.

Goldie & McCulloch (Flour Mill, Wood and Iron-Working Machinery, Fire and Burglar Proof Safes, Vault, Doors, &c.,) write :

Your favor of 1st inst. was duly received in which you ask our opinion in regard to the present state of trade and prospects for the new year on which we are about to enter. In answer to this we beg to say, that so far as we are concerned, the volume of business done by us this year has been very considerable, having much exceeded our anticipations at the early part of the season. While the orders in all departments have not been equal, in some they have been very large in numbers and amount, thus maintaining the general volume of work, and in some shops necessitating the working of a large amount of overtime—notwithstanding the many labor saving machines that have been introduced by us during recent years. Our shop buildings, as you are aware, have all been rebuilt and refitted within the last few years, and are now, in the general style of their fitting up and equipment, quite abreast of the most advanced lines of mechanical art and architecture anywhere, and it will be our constant study to maintain and in every possible way to improve on the high standard of workmanship and design we have constantly aimed at, and for which the general public has been pleased to give us credit. In this way, we hope to give our patrons the benefit of our efforts and expenditure without any additional cost to them.

The general character of the business done by us this season will, we believe, be found to be very sound and fairly profitable. We have special pleasure in noting the fact, that during some months past the cash payments made by our customers have been usually large and steady, and much in advance of those of any equal period for a considerable time previously.

With reference to the future we can only say, that judging from present indications, we shall enter on the coming year with a large number of orders on our books.

The Polson Iron Works Co., Toronto, write :

Although laboring under the fault of being only a young concern, the Polson Iron Works Co. has enjoyed a very successful year, and although 1888 is but the second year in its history, the business has doubled that of 1887, and the list of employees has increased in that time from 100 to nearly 500 men.

During the year, the company has purchased additional land on the esplanade, doubling the size of their premises, which now cover about three acres between Frederick and Sherbourne streets, and have made large additions to their buildings. In their shops, too, they have

added largely to their facilities, especially in the equipment for heavy engine and boiler work. In the erecting shop they have built a crane, capable of lifting 25 tons, and moving this weight to any part of the shop. By means of this crane, a large marine engine of 1630 horse power is now being erected.

In the new boiler shop, the equipment is being made very complete, and adequate to all demands. The plate rolls will handle plates 12 ft. 6 in. long, the top roll being 17 in. in diameter. A large punch and shear has been added in this shop to handle heavy boiler plate, so that the company is now in a position to build the largest sizes of marine and high pressure boilers.

In the smith shop a large steam hammer has been built, with cylinder 11x36—and preparations are being made for the construction of a large heating furnace for forging.

In addition to these improvements and enlargements in the Toronto establishment, the Polson Iron Works Co. has inaugurated a new industry in Canada viz: That of building large steel steamships for the great lakes. About midsummer they made a contract with the Canadian Pacific Railway Co. to build for them a steel steamship 305 ft. long, and in the short time which has elapsed since then, they have equipped a large yard at Owen Sound, built shops aggregating over 600 feet in length, set up a large and complete equipment of machinery for shipbuilding, shipped over 1000 tons of materials, and have this immense steel vessel nearly ready for launching.

In equipping this steel shipyard, no expense has been spared to make it complete in every respect, and the most modern machinery has been obtained. Their plate rolls weigh 6000 pounds and are the largest in Canada: their plate planer handles 16 ft. plates; their beam bender is of the most modern design; the angle cutter and drills are built especially for this work; and with 5 heavy punches and shears, the largest being able to punch a 1 1/4 in. hole through 4 in. plate, the machine shop is equal in equipment and convenience to the best Scotch or English yards.

The prospects for the coming year are very encouraging, and already tenders have been solicited for the construction of several steel vessels. Every indication points to a large and lucrative business in this line, and no effort will be spared to meet all demands.

The Kay Electric Co., Hamilton, Ont., write:

On the 1st of June, the Kay Electric Co. commenced business, buying out A. Kay, who had been doing a small electric business without any capital. We began with \$3,000 paid up capital, but the work has so grown on us that we are increasing to \$28,000. We began with only 4 men, now we have had to put in engine power, lathes and tools for 13 men, and it continues to grow. We have put in arc and incandescent plants all over the country, and plating dynamos all over the Dominion. From sales of under \$500 a month, we are making over \$2,000 monthly, and the prospects are brightening. As we write you, we are making improved electric dynamos. Have now as we understand, the only self regulating light, without the use of resistance boxes, and are prepared to produce electric plant equal to any American Co. As our prices are lower, we think Canadians should patronize home work.

Wm Kennedy & Sons (Water Wheels, Shafting and Gearing, Propeller Wheels, &c.) Owen Sound, Ont., write:

From Feb. last to opening of navigation we were fully employed with steamboat work—from then until now we have been very busy at water wheels, heavy shafting and gearing therefor, and propeller wheels. We have just completed a contract for a two and a quarter million gallon pumping machinery for Welland water works. This is a new branch of our business, and so far is satisfactory. As we do not keep any one on the road, give very little and very short credit, and do not pretend to do work unless it pays, our business grows at a moderate rate. Rather than spread out, we drop poorer paying work, and give more attention to that which remains. Our shops are new and were built with a view to increasing trade, consequently we have not been compelled to enlarge yet. Improvements have been confined to our pattern list of water wheels, gearing, propeller wheels, &c., to meet the requirements of our customers, and success is attending our endeavors.

Business is better with us now than it has been for years back, and prospects for work are better than a year ago.

James Jones & Son, (Mill Builders, Milling Machinery,) Thorold, Ont., write:

To your questions regarding the business done by us during this year and our future prospects, we beg to say that we have done a fair business, although it was not

quite so large as last year, but quite satisfactory when we consider the depression that has characterized the milling business for the last few years.

As to the prospects of the coming year we, cannot at present properly judge. If we take the number of enquiries made and estimates asked for, for new mills and changing from the long system to the short system, we think there will be considerable business done. We build on the short system only, as we have found by practical tests that better results can be obtained at much less expense. As to improvements, we would say that we are manufacturing a very simple mill, (especially adapted for custom work) in which we use two single sets of rolls to complete the grinding process. This mill will meet a want that has been long felt by millers of limited means, as it will enable them to compete with others who have more expensive machinery. We think that the small mills that have a local trade, have better prospects before them than for some years past.

Waterous Engine Works Co., (Saw Mill Machinery, Engines, Grist Mills,) Brantford, Ont., write:

The change in our business for the past year over that of former years had been so slight that it is hardly noticeable. Our improvements also have not been of any moment, and none are contemplated. The change in our business has apparently been so slight that it is difficult to form any opinion of what it may be in the future. However, we do not see that it is likely to be any worse, and the difference in the position of the farmers, owing to the good prices they are receiving, should benefit trade. Lumber also appears to be a good price, with plenty of buyers. We cannot see, therefore, why trade should not be as good next year as it has been this year.

The London Machine Tool Company, London, Ont., write:

In answer to your favor of the 1st would say, that we have had a very successful year, having sold fully one-third more tools than we have done any previous year, and the prospects for the future are very encouraging. We have at present a large number of orders on hand, which will keep us busy during the winter.

We have made several improvements in the works, and are constantly adding to our plant, the latest addition being an Automatic Gear Cutting Machine from Gould & Eberhardt, of Newark, N. Y., and we trust by keeping a good line of well made tools of modern construction, to merit a continuance of the favors and patronage given us in the past.

George F. Haworth & Co., (Leather Belting and Patent Lace Leather,) Toronto, Ont., write:

Yours of first to hand. Belting trade with us the past year has been good, and we have no reason to complain whatever, it having increased two-fold over any previous year.

The outlook for next year seems to be very promising, we are pleased to say.

James Robertson (Metal Merchant, and Saw Manufacturer,) Montreal, writes:

Your esteemed favor of 1st inst. received. I have really nothing special to remark about my business here, my saw business keeping about the same as last year. The other branches of my trade, including manufacture of lead pipe, shot, white lead, have been fairly busy. The competition in all branches has been so keen, prices have not been very remunerative.

Butterfield & Co., Rock Island, P.Q., write:

The result of our business in the manufacture of stocks, dies and taps during the year would hardly be a fair test of the business situation of the country.

We commenced business in 1880 and have made steady progress from then to the present.

Each year we have put in more or less new machinery as increasing business required, and 1888 has been no exception.

However, in looking over the whole situation, we believe that the volume of business for the year will show an increase both in the United States and Canada. We are of the opinion that now, as the political agitation is out of the way in the United States, which has no doubt had an unfavorable influence on trade, both in the United States and Canada, the coming year will give us a season of unusual prosperity.

Robin & Sadler (Leather Belting) Toronto and Montreal, write:

Replying to your favor of the 1st inst. up to the present time this year's business has equalled that of 1887, which for the last four or five years was the most

prosperous one for us. We expect the balance of the year to show up well, as we have orders on hand and others in view. It is difficult to say what the prospects are for 1889, although we are hopeful.

We distribute our goods throughout the length and breadth of the Dominion to be put to actual use in turning the wheels of industry, so that we may consider the milling and manufacturing enterprise of Canada to be in a healthy condition when the belting trade is fairly good.

H. W. Petrie (Machinery Broker,) Brantford Ont., writes:

Complying with your request regarding present state of trade and future prospects, I beg to say I have done a very large and profitable business during the past year. Notes have been fairly well met, and I have more orders on hand and employing more hands than ever before. The prospects for the coming year are bright indeed.

Dick, Ridout & Co., (Jute and Cotton Bag Manufacturers,) Toronto, write:

In reply to your enquiry of the 1st inst. would say, that our trade has been steadily growing during the past year, although the small quantity of flour exported limits the number of bags required. If the export trade were increased, of course the demand for bags would increase also. We are of the opinion that unless other uses are found for bags, the manufactories engaged now in supplying the trade are quite equal to the present demand.

The price of jute cloth, which is imported from Dundee, Scotland, none being made in this country, has been increasing during the last year, and is now fifty per cent. higher than it was twelve months ago, consequently we have been compelled to raise the price of bags. This has had a tendency to limit sales, our customers only purchasing just what they require for present use, in the hope that prices will be lower. We do not think, however, that this will be the case before next spring, as the present price of jute is nearer its actual value than the lower prices which ruled previous to the recent advance.

While we prefer not to say much in regard to future prospects, we may state that we have no reason to doubt that the volume of our trade for next year will show an improvement on that of 1888.

The Wm. Hamilton Mfg. Co., (Saw Mill Machinery, Flour Mills, Engines, Boilers, &c.) Peterborough, Ont., write:

Your favor of 1st to hand and noted. In reply would say, that our fiscal year does not extend from January to January, but from August to August, therefore we base our calculation upon that. We might say that business in and for year ending July 3rd, 1888, has been fairly satisfactory, we having done 16 2/3 per cent. more business, or rather volume of business, than we did in the previous year. During the year 1887-8 the price of iron had advanced, also wages, hence we are compelled to raise the prices on some classes of work which had heretofore been cut very fine. During that year we made no improvements to speak of, as only the year previous we had expended about \$10,000 in new additions to our works, as well as new tools. Since July, 1888, we have now almost completed another addition to our machine shop, being of brick, 165 feet long, 34 wide, two stories high, and are also getting in some more new tools, making the new improvements this year cost from \$8,000 to \$10,000.

From the general outlook of business, we would think our business will increase this year at least the same percentage over last year as last year did over the year previous.

A. Laidlaw & Co., (Grain Cleaning Machinery,) Parkdale, Ont., write:

Our business during 1888 has been very satisfactory, our sales being double those of the previous season.

We find our present premises altogether too small, and next season intend making considerable additions and extensions.

The prospects for next year are very encouraging, and we expect the output will be largely in excess of the two previous years.

We have just completed the placing of a 1000 bushel per hour barley cleaner in the Grand Trunk Railway Elevator at Port Hope, Ont., which is giving first class satisfaction.

Charles Barber, (Water Wheels, &c.) Meaford, Ont., writes:

I am of the opinion that the country is passing through a pretty severe crisis, that is bearing particularly hard on the farming interest and those trades more immediately

depending on it. Manufacturers are suffering through the poverty of their customers, both as to sales and collections, and I fear will do so for some time, especially in the grain growing districts of Ontario. I would therefore advise:

1st. Cautious expenditure. 2nd. Make no risky sales. 3rd. Be alive to push all healthy businesses. 4th. Be content with moderate profits with no risks; 5th. Agitate for a reduction of the burdensome taxation that is oppressing to the producers and consumers, and with a few good crops the country will recover its wonted prosperity.

In our business we have suffered much by the general depression in our local trade, but have done a fair business, and prospects for the future we think warrant us in enlarging. We propose to build a large moulding shop, and are putting in one of S. McIlvanie's new gas machines for lighting our shop, which will enable us to run full time in winter, without loss by defective lighting.

Inglis & Hunter, (Engineers and Foundrymen, General Mill Furnishings,) Toronto, write:

Replying to your favor of the 1st inst., we would say that so far, the amount of this season's business has been satisfactory, and in excess of last year's, but prices all round have been exceptionally low; in the engine and boiler, and mill furnishing departments, the prospects for next season's orders are good, especially as owing to the present keen competition in all branches of trade, profits are considerably reduced, forcing the adoption of improved machinery to lower cost of running expenses. Manufacturers and vessel owners are at last becoming alive to this fact, and consequently there is considerable enquiry for compound engines, and we anticipate doing a heavy winter's business in compounding marine engines, &c. There is also a tendency towards ordering heavier and more economical machinery than hitherto placed in Canada, and we are now busy upon a 400 h.p. compound condensing plant for the C.P.Ry. elevator at Fort William, and have just finished a pair of 17x66 paddle wheel engines &c., for the steamer "Aurora" on Lake Winnipeg.

The same remark as to reduction of general running expenses applies particularly to grist mills. We have done a considerable amount of work in this line, and the great success attending the "Case" short system is leading millers to seriously consider the question between "long" and "short" systems. By the latter, equal if not better results are obtained, at a reduced first cost, and less expenditure of power. We consider that as a whole, Canadian manufacturers in our line are being more extensively patronized for first-class economical machinery than formerly, the idea that this was obtainable abroad only having, fortunately for this country, entirely exploded.

The Royal Electric Co., Montreal, write:

The year 1889 opens with particularly bright prospects in our department, and for the first time it is possible to meet the requirements of everybody desiring electrical apparatus for either light or power, whether in the crowded city or the country village, and whether the source of power for driving the machinery be near at hand or situated at a distance of several miles from where the light or power is to be utilized. The outlook is exceedingly promising.

J. L. Goodhue & Co., (Leather and Leather Belting,) Danville, Que., write:

Our business during the present year has been exceptionally good, our sales being fully 25 per cent. more than any previous year.

Selling as we do to saw mills, cotton mills, woollen mills and manufacturers of all kinds, from Halifax to Vancouver, our business is, we think, a good barometer as to the general prosperity of the country, and in no line have we experienced any falling off, and in some, especially our trade with saw mills, there has been a marked increase, having fitted out more large new mills than for several years past. We have increased our output largely, and found it almost impossible to keep up with the demand for our best grade, "Standard" belting.

We feel so well satisfied with the outlook for the coming year that we are putting into our tannery one third more hides weekly than during the past season, so as to meet the expected demand for our goods.

Runciman Bros., (Mill Contractors and Engineers,) Hamilton, Ont., write:

We have much pleasure in stating in reply to your enquiry, that our business has been keeping just about the same as past years. In fact, we have all we can nicely attend to. As regards next season's work, every-

thing looks favorable just now, and if the prices for wheat keep anywhere near the \$, it will be some inducement for millers to invest in mill machinery.

A Robb & Son, (Amherst Foundry and Machine Works,) Amherst N. S., write:

Year by year, as the mining, lumbering and other industrial interests of the Maritime Provinces grow in importance, we find a proportionate increase in the demand for machinery of all kinds, and steam power to drive it. The old gang saw mills are giving place to portable circular mills, which are better adapted to the smaller logs. Many farmers who have small wood lots are making use of them to clear land, at the same time producing lumber which would otherwise be destroyed. We aim to supply this want with a light circular mill, and a peculiar design of portable engine and boiler, which we are able to build as large as sixty horse power, without its being too heavy to move on wheels into the forest. Of this class of saw milling establishment, we are producing an average of about two per month, which, with a constant demand for stationary engines and boilers for mining, electric lighting and various other purposes, we have been kept exceptionally busy during the past twelve months, and have found it necessary to extend our work in various departments. We have added about \$3,000 worth of machine tools, and have built a suite of commodious offices and draughting rooms for machinery and milling supplies; have under construction a boiler shop 50x60 ft., which is to be fitted with two travelling cranes, and many improved appliances for building and handling steam boilers. Our foundry which is 125x50 ft. is too small, and will require a further addition in the spring to enable us to keep pace with our orders. The "ship railway" which is being constructed across the Isthmus of Chignecto, (about 2½ miles from our works) to convey vessels from the Bay of Fundy to the Gulf of St. Lawrence, or vice versa, which, by the way, is the first undertaking of this kind in the world, is already giving us a considerable amount of work, and will no doubt cause increased activity throughout this section of the world during the next year or so.

Globe File Mfg. Co. (late G. Outram & Sons, Montreal) Port Hope, Ont., write:

Though the year fast closing has been marked by keen competition, it has not been without beneficial results. Manufacturers have had to canvass the trade more thoroughly, and have become better acquainted with the requirements, and the quality of goods produced is now better. In our own case, we have sold all the goods we could make, and believe have given better satisfaction than for years past. The future we regard without fear, believing home industry will gradually gain for itself the preference with buyers. As you probably know, we are removing our old established business from Montreal to Port Hope, and increasing our facilities to twice their present dimensions. We hope to be in operation by the middle of January, and shall be glad to show you or any of our friends the finest file factory in the Dominion, whenever you call on us.

Wm. & J. G. Greey, (Toronto Mill Furnishing Works,) Toronto, Ont., write:

In reply to your enquiry would say, that although not as busy as last year, the past season has been a very successful one in our particular lines. Prices have been if anything closer and competition keener, but owing to the introduction of our improvements in connected rolls and rope drive, we have been enabled to keep in the field and secure a fair share of the mill building business. We anticipate rather quiet times in our line till spring, as usual at this season. We have many enquiries, and look forward to the coming season with much confidence. We have met with great success in the new features we have brought out the past season, and believe that the system of connected rolls and rope drive is destined to replace the ordinary separate rolls in every mill where economy in power is an object. It has been put into some 18 mills by us during the past season, and in every case the results have been surprising in the small amount of power required as compared with the old style of drive. We have put in a full line of lathes, presses, grinders and corrugators, for the purpose of making chilled iron rolls, and are now prepared to turn out rolls of a quality equal to the best that can be imported.

The Canadian Rubber Company, Montreal and Toronto, write:

The volume of trade done by us during the past year has greatly increased as compared with any former year, both in goods for mechanical purposes, such as belting, hose, etc., and in boots and shoes. The increase

in both departments we attribute to the high standard of manufacture attained and maintained.

During last year and this, we have found it necessary to build additions to our factory, aggregating 420 x 60 feet, five flats, and have added to our plant a lot of expensive machinery, the addition to buildings and machinery costing \$200,000. These additional facilities will ensure the filling of all orders promptly in the future. A healthier tone in business generally prevails, and in our opinion, trade is not so bad as some people would have us believe.

IMPROVEMENTS IN CHATHAM AND ST. THOMAS MILLS.

IN a letter to the MECHANICAL AND MILLING NEWS, Messrs. Campbell, Stevens & Co., of Chatham, write:

During this year, we have made a number of very important changes in both our St. Thomas and Chatham mills. Early last summer we let a contract to the Geo. T. Smith M. P. Co., of Stratford, for thoroughly overhauling the St. Thomas mill, changing the drive of the rolls from gear to belts, adding four roller mills, aspirators, Cyclones, and changing the entire programme of the mill, thus increasing the capacity from 300 to 500 barrels per day. The changes are highly satisfactory to us, as the output is largely increased, and the quality of the flour giving most excellent satisfaction all over. The changes in our Chatham mill have not been on such a large scale, but are also very important ones. A large new steel boiler, built by McKeough & Trotter, of this place, was substituted for one of the old ones, and one of Northey & Co.'s independent air pump condensers has taken the place of our old one. These changes give us great satisfaction, as the new condenser works splendidly, gives no trouble, takes little steam, and creates almost perfect vacuum. Some other changes in the mill, such as changing the corrugation of some of the rolls, putting new cloth on reels and purifiers, etc., has greatly improved our flour, so that now we feel confident our flour will please the most fastidious.

We had the misfortune to lose our cooper shops here early in the spring by fire, and consequently had to rebuild during the summer. These we have now completed, and built as they are of brick with gravel roofs, we think they are the most complete shops in every respect there is in the Province. We have ample storage capacity for 10,000 empty barrels, and fully half a million staves, besides other stock. On the whole, although we have had to invest a large amount of money in changing and rebuilding our mills and appurtenances, yet we are well satisfied with the year's operations. The output has been much larger this year than any previous year, and the general satisfaction our flour has given, has made the year's business one of the best on record. We contemplate enlarging and extending our business again next year, but at present we cannot enter into particulars."

WATER POWER.

THE great tidal streams through the country, or that generated at the coal mines, where fuel is cheap, could be transmitted hundreds of miles and sold for a mere song. In an address delivered in Glasgow some years since, Professor Siemens, the eminent electrician, said that in England a means of transmitting power by electricity must soon be the all important question of the day. "What are the English to do," he inquired, "when their coal is exhausted?" Of Niagara Falls, he said, "The amount of water falling over Niagara is equal to 100,000,000 tons an hour, falling 150 feet. The amount of coal required to raise such a weight up to the point from which it fell, which is a measure of the amount of power yielded by that water in falling, would require the consumption of 260,000,000 tons of coal, which is the amount of coal now consumed by the entire world. Now, if 50 per cent. of the power used to drive the first dynamo machine could be recovered from the second, and hence if the whole power of Niagara could be utilized, it might be distributed over the United States, so as to give from that waterfall alone, a power equal to the present entire mechanical force of the world, estimating that one half the coal used is solely for mechanical purposes." The means by which Professor Siemens would draw the power from the falls would consist of a series of flumes from the edge of the descent of the American Falls, to the level of the water below, of a size large enough to carry the waters of the Niagara river through water wheels.

The Secretary of the Toronto Board of Trade has received samples of the flour standards for 1888-9, from the Department of Inland Revenue. The grades are "superfine," "extra," "strong bakers," "patent winter," "patent spring," and "straight roller."



The Ulthoff, Ont., shingle mill has been rebuilt.

Hill & Berry, lumber merchants of Fredericton, N. B., have assigned.

Cockburn's mill at Gravenhurst, Ont., recently destroyed by fire, will be rebuilt.

Messrs. Millburn are about to erect a new saw and shingle mill at Desboro, Ont.

Mr. W. T. Fellow's saw and shingle mill, at Port Albert, Ont., was consumed by fire a week or two ago.

The twin saw-mills, owned by John Robinson and Harvey Copp, were burned at Midgley, N. B., Nov. 2nd.

Winter operations in the New Brunswick lumber districts will be carried on more extensively than usual.

Caldwell & Son's mills at Carleton Place, Ont., have closed down. The season's cut was 9,000,000 feet.

W. & W. Addison, lumber dealers, Hamilton, have assigned, with between \$50,000 and \$75,000 liabilities.

The capacity of Fader Bros.' new mill at Vancouver, B. C. when completed, will be about 100,000 feet per day.

Lumbering operations on the Ottawa, during the coming winter, promise to be the most extensive for several years.

Huntsville, Ont., claims the best shingle mill in the north country. Two machines in it cut 103,500 shingles in one day.

It is proposed to form a company at Selkirk Man., to operate the large saw mill that has been idle for some years.

The Georgian Bay Lumber Co., of Waukegan, Ont., have already sent nearly one thousand men to the woods.

Lumbermen say this is the wettest and most unfavorable fall they have had for years, for lumbering operations in the woods.

Fred Robinson, of the Beaver saw mills, Donald, B. C., has turned out between 2,000,000 and 3,000,000 feet of lumber this season.

A young man named Leckie, had one of his hands taken off recently, by a saw in the Canada Lumber Company's mills, at Carleton Place, Ont.

Joseph Paquette's sash and door factory and planing mill Montreal, was completely destroyed by fire on Nov. 5th. The loss is estimated at \$70,000 with no insurance.

Owing to the prevailing high ocean freights which has stopped the export, 100,000,000 feet of lumber is said to be piled in the yard at Ottawa, and piling ground is becoming scarce.

Mr. David Eidt and Mr. Henry Eidt, of Phillipsburg, Ont., have purchased Mr. P. Kuechtel's saw mill at Hanover, Ont. The business will be carried on under the name of Eidt Bros.

The proceeds of the late Quebec sale of timber limits averaged \$20 per mile more than the sale of 1885, while a Montreal purchaser refused on the spot a bonus of \$3,000 on a portion only of his purchase.

Since the Government placed a mounted police patrol on the boundary line between Manitoba and Dakota, several persons have been caught in the act of hauling Canadian timber into the United States without payment of duty.

Leading Ottawa lumbermen are said to believe in the possibility of building up an interprovincial trade in lumber, which will render them independent of the United States markets. The local consumption in Montreal in 1880 was 45,000,000 feet, which in 1887 ran up to 120,000,000, or about 20 per cent. of the cut of all the mills in Ottawa and vicinity.

A statement of the receipts of the crown lands department of Quebec, for the current year to date shows that they have increased to \$786,771 against \$450,926 in 1887, or against an average of \$472,719 per annum for the last five years. The government estimate that crown land collections will reach one million dollars when the accounts for the current fiscal year are closed.

Mr. G. W. Stokes, of Windsor, has been in the lumber trade nearly all his life, and has now large tracts of timber in different parts of Canada and the United States. Speaking about the Dominion government's export duty on logs, he says:—"It is only a square deal, but instead of \$3 it ought to be \$10. If the Americans want Canadian logs let them bring along their mills, cut the logs up and spend a little money in the country from which they derive their revenue."—*London Free Press*.

Professor Bell, of the geological survey, who has just been exploring in that part of the country lying between the Missisquoi river, the northeast coast of Lake Huron and the Montreal river (a tributary of the Ottawa) reports that excellent timber is now being cut in that locality. This territory was sold by the Ontario government, about ten years ago, in sections of sixty square miles each. Most of the timber is being taken out by American operators who own the limits, but Professor Bell states that the supply is very limited owing to the terrible havoc which has been made in that district by forest fires. He believes that the Upper Ottawa districts are becoming pretty well cut out. He reports an extensive tract of country north of this territory, which was sold ten years ago, by the Ontario government, extending north of Lake Huron, and which is one of the finest pineries in Canada. He says that the supply is almost unlimited. The Canadian Pacific railroad runs through the center of the district, which as yet has not been surveyed and which has yet to bear the first blow of the lumberman's settler's axe beyond that which was used in the construction of the railway.

The *Northwestern Lumberman* thinks the Canadian authorities are laying it on pretty thick when they say, as the Minister of Customs who took advantage of the power given him by statute to increase the export duty on pine logs from 2s to 3s, is reported to

have said, that the enormous quantities of pine logs which are being exported from Canada to the United States threaten to soon deplete the Canadian forests. In all probability the logs brought across the line this season will aggregate but little, if any, more than Gilinour & Co.'s big mill at Trenton, Ont., with an average daily capacity of 500,000 feet, could cut in a season. In 1887 the mills of the northwest produced a total of 7,760,000,000 feet of lumber, and 7,425,000,000 shingles, in round numbers, without importing 3,000,000 feet of Canadian pine logs, and while some operators on the border are anxious to get Dominion logs to supply their mills, it is absurd to talk about their being able to rapidly denude Canada. It is said that about 200,000,000 feet of pine logs would have been exported from Canada next season by Michigan mill men, except for the increase of duty, but at that rate the Canadian infant would be gray when he saw his native land denuded, or more likely, after the manner of the Irish bull, he would be dead. But the Minister of Customs says if \$3 duty will not limit the export of pine logs, he will next season ask parliament to grant power to increase it to an extent that "will insure protection against the wholesale destruction of the Canadian forests." It is contended that in permitting the export of pine logs to the United States to be manufactured into lumber, the Dominion government is encouraging competition with Canadian sawed lumber in the United States markets. The endeavor of the Canadian government will therefore be to place such restrictions on the export of logs to the United States as will compel those Americans who, with this object in view, have invested heavily in timber limits in the Dominion to saw their lumber in Canada in place of the United States. Ottawa, Ont., lumbermen express their unqualified approval of the step the government has taken, and it is believed that the increased rate of duty is mainly the result of various tests.



Mr. Buck, of Norwood, is changing his mill to full roller mill, using the Hurford flour bolts and Cochrane rolls. Runciman Bros. have the contract.

Mr. Alonso W. Spooner, Port Hope, Ont., calls the attention of manufacturers in this number of the *MECHANICAL AND MILLING NEWS*, to his "Copperine" box metal, for machinery bearings. Those of our readers who are troubled with hot boxes, should correspond with Mr. Spooner for proof of the merits of "Copperine."

Mr. John Radigan, of Hamilton, whose advertisement will be found on page 15 of this issue, has moved into his new and commodious buildings on Kelsey St., the demand for his elevator buckets being so great that he has been forced to build the fine factory he now occupies. His facility for fulfilling all orders entrusted to him, promptly, is unsurpassed.

Messrs. Jas. Jones & Son, the well known mill furnishers, of Thorold, Ont., are calling attention in this number of the *MECHANICAL AND MILLING NEWS*, to their "Model Custom Mill," which only requires two sets of rolls to complete the grinding process, and two reels to do the bolting. Messrs. Jones & Son are firm believers in the efficiency of short system milling.

FIRE-PROOFING WOOD WITH ZINC.

CONCERNING the zinc-water method of making wood fire-proof, N. Utzer, of Pittsburgh, Pa., states that after many years of chemical research, he discovered that wood could be made absolutely non-combustible, if treated in the following way: Common zinc was dissolved under a pressure of two atmospheres in hydrochloric acid; this process took place in iron stills coated upon the inside with a thick coating of asbestos cloth. The solution was treated with lime to remove all excess of acid, and then varied proportions of borax in watery solution were added. The beams or boards to be treated were dried in a kiln and placed in an iron frame provided with screws on the principle of a monkey-wrench, and in such a manner that the four sides of the iron frame could be screwed tight upon the surface of the wood. Then one end of the wood was placed in the zinc solution and the other end fitted to a suction-pump and subjected to a strong suction. Through drying in the kiln all of the moisture had been expelled from the cells of the wood. Under a microscope a section of the wood presented an appearance similar to that of a honey-comb. Naturally, as soon as suction was produced, the zinc liquor ascended through the wood as really as the sap penetrates upon a warm spring day. It required about ten minutes to saturate a beam twelve inches square and sixteen feet long. At the end of ten minutes the beam was taken out of the frame and placed aside to dry. Chloride of zinc itself dries rapidly; that is, the water of solution evaporates, leaving the dry salt. It generally took two days for a beam to dry completely. By this treatment, the physical appearance and structure of the wood had changed most remarkably; common pine wood had acquired the hardness of oak and the suppleness of hickory. But the most remarkable change was in its behavior towards fire. Placed in a glowing fire, a piece of wood treated as above would not burn, did not even commence to glow, but merely "oxidized" away, if such an unchemical expression may be used.

A coating of coke or charcoal would slowly form, covered with an incrustation of chloride of zinc, which gradually through the agency of the heat changed into yellow oxide of zinc. It was only after this layer was removed that the action of the fire proceeded further and formed a second layer.

BAND SAWS VS. CIRCULAR SAWS.

AS regards rapidity of production, the circular saw has at present a decided advantage, producing on an average, in white pine, 50,000 square feet of lumber, 1 inch thick, in a day of ten hours; while the band saw, in the same time, turns out on an average about 35,000 feet. It should, however, be borne in mind that the circular saw, having been in use for so many years, has probably reached its utmost limit of production, while, on the other hand, the band saw, having been but recently introduced for this purpose, is capable of considerable further development. This assumption is confirmed by the fact that a band-saw mill of the most approved construction has been known to produce as much as 52,000 feet in a day of ten hours—the product of 102 logs.

As regards quality of work, the advantage is undoubtedly on the side of the band-saw, for whereas it is practically impossible to run a large circular saw at a high velocity without a certain amount of vibration, which naturally produces a somewhat rough surface, a band saw, being packed immediately above and below the cut, passes through the log in a straight line; and, moreover, as the teeth of a band saw are considerably finer than those of a circular saw, they produce a smoother surface. It is unfortunate that, owing to the question of power being so little considered in America, and to the fact that the application of the band saw for logs is comparatively new, no authentic tests as to the power required by the latter machine have as yet been made with the indicator; but by comparing the engines usually employed to drive both the band and circular mills, an approximate idea on this point may be arrived at. To drive a circular mill with a 6-foot saw, an engine with a cylinder 18 inches in diameter, a piston travel of 500 feet per minute, and an average pressure on the piston of 40 pounds to the square inch, is generally employed. Such an engine develops 154 indicated horse-power. To drive a full-sized hand mill, an engine with a cylinder 12 inches in diameter, working under similar conditions as to piston, speed and average pressure, is recommended. This would develop about 98 indicated horse-power, or considerably less than one-half that required to drive a circular mill.

The last, but certainly not the least, important point, is the question of waste of wood; and here again the band saw gives by far the best results. The amount of wood lost in sawdust per cut by a circular saw is six-sixteenths of an inch; therefore, when producing boards 1 inch thick the waste is 31.25 per cent. A band saw at most wastes one-eighth inch per cut, or, when cutting 1-inch boards, 12 1/2 per cent. Again, to make a board cut by a circular saw, when planed on both sides, hold up to seven-eighths of an inch, it must be cut 1 inch thick—that is, one-sixteenth of an inch must be allowed on each side for planing; while, on the other hand, owing to the superior cutting of the band saw, it is only necessary to allow one-thirty second of an inch on each side for planing, showing an additional saving of one-sixteenth of an inch per cut. This gives a total saving of one-fourth of an inch per cut by the use of the band saw.

The foregoing calculations apply to timber of such a size as can be converted by a circular saw 6 feet in diameter; but for larger logs, it is necessary to employ an overhead saw, and as the tracks of the two blades never exactly coincide, the boards thus sawn show a joint, which necessitates a still further waste of wood. This objection does not apply to the band mill, which will saw through logs of any diameter.

It is thus evident that for the conversion of pine logs the balance of advantage lies distinctly with the band saw; and if this is so in the case of comparatively small and cheap timber, it is certain that for the more valuable descriptions of hard woods, which frequently run to very large sizes, these advantages would be enormously increased; and it is not too much to say that the band saw will in a few years be universally employed in preference to any other machine for the wholesale conversion of timber.—*Manufacturer and Builder*.

For sale, at a reasonable figure, best Automatic Grain Scale on the market, with sufficient capacity for mill of 100 barrels. Apply to the publisher of the "Mechanical and Milling News," Toronto.

THE CANADIAN MILLER ABROAD.

By "QUIZ."

SEVERAL of our Canadian millers have crossed the Atlantic during the past summer in search of health, pleasure, knowledge, or a combination of all these worthy objects. I like to chat with them about European mills and millers, and the methods of doing things over there as compared with our own.

"One of the things that surprised me most over there," said one of my trans-Atlantic miller friends, the other day, "was the expensive method of handling grain. There are no such things as grain elevators in Great Britain. The grain is all handled in sacks. It arrives on the vessel in sacks, and is thus conveyed to the mill. And just here let me say a word about the British mills. I was greatly impressed with the immense size of the first mill I visited. Judging from its size I estimated that its capacity could not be less than 1,000 barrels per day. You can picture my surprise, when, upon entering, I learned that the capacity did not exceed one hundred barrels. The great size of the building was due to the fact that the British miller stores all his grain in his mill, instead of in an elevator. The only elevator I saw after leaving America, was an arrangement for hoisting the sacks of flour to the upper stories of the mills. The grain is not emptied into bins when it reaches the upper floors. The varieties of wheat received from different countries is emptied only for the purpose of being mixed to suit the purposes of the miller. After mixing, it is put back into the sacks again, and stored until wanted for grinding. You can imagine how expensive this method of handling grain must be, and how much it must add to the cost of the production of flour."

Why in the world don't they adopt our plan? I suggested.

"That is exactly the question that I was accustomed to ask myself," said my friend, "until I went over there and saw the condition of affairs. The great difficulty in the way of changing the system lies in the fact that the railway transportation facilities are not adapted for handling grain in bulk. For instance, there are no box cars on European railroads. Freight cars are all open, their contents being exposed to the weather, when fine, and covered with tarpaulins, when wet. Grain cars have a kind of rack or railing on the outside."

But if the cost of handling grain in sacks is so great, would it not pay to change the style of cars to correspond with those on American roads? I enquired.

"If you were to see how substantially and expensively these cars are built," said the miller, "you would be inclined to hesitate before proposing to change the system, unwieldy and expensive as it certainly is. The disadvantages of the system as compared with our own, are at once apparent, but I am afraid that I am not equal to the task of proposing a remedy."

Has not the condition of the milling business in Europe improved of late?

"Yes, I think many of the British mills are making money."

To what do you attribute the improvement?

"It is largely due, I think, to a better understanding of modern milling methods. While a large majority of the mills in America have adopted the roller system, the bulk of the British mills are still using stones. Those mills which have adopted improved machinery, have done so quite recently, and as roller process machinery has been undergoing steady improvement during the last seven years, the British roller mills are as a consequence well equipped, and are turning out a product of much better quality than formerly."

I suppose the British bread-eater, is a critical customer, and turns his nose up at flour that is in any respect inferior.

"Nothing of the kind, I assure you. While there is a demand in certain quarters for first-class flour, by far the greater proportion of the flour sold in England is low grade. This can be seen by a glance at the kind of bread they eat over there. It is so heavy and hard, it might be used for cannon balls. To a Canadian it is an inexplicable mystery how the Britishers continue to eat such stuff without utterly destroying their digestive apparatus, but they do, and what is more, on such diet they wax fat and flourishing, and as a rule enjoy better health than Americans or even Canadians. Probably the magnificent climate they live in is the secret of their success in defying what in this country is regarded as one of the fundamental rules of health."

The saw mill, stave and heading factory, at Teeswater, owned by Mr. W. R. Thompson, and operated by Thompson, Fessant & Co., was burned on the 17th November. The mill was totally destroyed, but the stock in the yard, consisting of 300,000 feet of lumber, 500,000 feet of heading, and 100,000 staves, were nearly all saved. Mr. Thompson places his loss at \$5,000.

SHORT SYSTEM.

By "RAY."

THE first thing to be considered in connection with a short system, and upon which the success of the system will depend fully as much as upon the subsequent operations of grinding, bolting and purifying, is the cleaning of the wheat. I have frequently been asked by five or six break advocates, why it is necessary to clean wheat better preparatory to a short system of reduction than a long one, and I have generally answered, that I was not aware that it was so.

Clean wheat is certainly a necessity in any system, but there is this difference in the effect of dirt in the two systems: When the desire is to make a high grade patent flour, of a percentage anywhere from thirty to seventy, if the wheat be not well cleaned, the effect will appear in the patent of the short system mill, but only in the baker's of the long system. It is the flour made on the break rolls that always suffers from the effects of dirty wheat, and as the flour runs to patent in the short system mill and to bakers in the long, the reason of its affecting the high priced flour in the one, and the lower in the other, stands explained. When the object is to make a straight grade of flour in both mills, it will easily be seen that the dirt would work as great injury in the one case as in the other.

Just what constitutes thoroughly cleaned wheat, is as yet an open question, some millers holding that when you have scoured the outside of the berry as well as is possible with the standard machines of the day, that you have done all that is necessary, while others contend that you must go a little farther, and after first splitting the berries, brush the broken pieces. I am of the opinion, that the splitting and brushing operation is not necessary, that the loss through the brushing away of good material will more than counterbalance any good that could be achieved by the operation. In the case of very smutty wheat, where the balls have become broken and thoroughly mixed through, a certain amount of it would be sure to find a lodgement in the crease, and a portion of this might be dislodged by the splitting operation, but when wheat is in this condition, the feed bin would be the proper receptacle for it.

There is an outside brittle husk which it is necessary to remove, together with as much of the hair from the end of the berry as possible, before the flouring operation begins. This husk pulverizes very easily between the rolls, and becomes incorporated with the break flour in such a manner that no bolting apparatus of the present time will separate it. The result is specky flour of a yellowish straw tint.

When your wheat presents a uniformly bright, smooth, hard appearance, with no wrinkled, woody patches on it, it is ready for the further operations. You can go farther, but the farther you go after this point is reached, the more harm you do, for you are weakening your bran, and rendering it less able to withstand the severe action of the rolls.

PERSONAL.

Mr. S. Hamlin, President of the Oshawa Milling Company, was married recently in the city of Hamilton to Miss Cusack.

Mr. M. Sherlock of Peterborough, has been appointed a foreman on the C.P.R. elevator at Fort William, and has supervision over thirty-six men.

Mr. A. Campbell, President of the Muskoka Lumber Co., has been elected a member of the council of the Toronto Board of Trade, to fill the vacancy caused by the death of the late Hon. James Patton.

Mr. Ed. Gorman received a number of severe cuts and bruises by the bursting of a grindstone at Shurley & Dietrich's saw works, Galt, Ont., a week or two ago. As the grindstone was running very fast at the time it is miraculous that he escaped death.

A very interesting event took place on the 23rd of October, at the village of Eganville, Ont. Miss Mary, third daughter of the late Mr. James Bonfield, M.P.P., and late proprietor of the Eganville roller mills, was united in marriage to Mr. Thos. G. Marion, of Des Joachim.

SUCCESS OF THE SHORT SYSTEM.

Editor Mechanical and Milling News.

WOLSELEY, N.W.T., Nov. 6th, 1888.

Please find enclosed \$1.00 for the MECHANICAL AND MILLING NEWS.

I see by your paper that the short system is still on the gain in Canada, as well as the States. I believe that I was the first to build a new mill on that system in Canada, and I still hold that it is all that has been claimed for it.

Yours respectfully,

W. D. COOK.

Lumbermen throughout the Georgian Bay complain that the past summer has been a very unfavorable one, as owing to the prevailing winds, many logs have been lost.



W. S. Foster, foundry owner, Cookshire, P. Q., has assigned.

Messrs. White, Henderson & Son, successors to Jas. White & Co., Campbellford, Ont., are overhauling the foundry at that place and putting in new machinery. They will devote special attention to the making and repairing of saw mill machinery.

Often the oil tanks are never emptied and the residuum removed and, as the pumps draw the oil from the bottom, the machinery is being daily lubricated with impure oil. The oil tank should have a thorough cleaning before new oil is again pumped into it. This is easy enough if the oil is removed, the tank inverted, and the steam nozzle applied to the mouth of the tank. This method of cleaning beats dipping the filth out with a waste. So many opportunities will present themselves when steam will be a valued help to cleaning machinery, if one happens to think of it.

We are told, says the *West Worker*, that Canadian insurance companies, for some unexplained reason, object to the use of sawdust as fuel. Judging from the practices this side of the line, there is no good reason why they should. If proper piping and care are used in conveying sawdust to the furnace or the refuse burner, there is no extra hazard, and if the American insurance companies objected seriously to such risks, sawdust would not be used for fuel in the States so universally as is the case. Saw mills, planing mills, and other wood-working establishments burn sawdust, shavings, etc., right along, and they appear to get all the insurance they want.

A very disastrous fire occurred on the morning of the 23rd Nov. in the city of Hamilton, at the Osborne-Killey Mfg. Co.'s works, when the pattern shop and all the patterns belonging to the company, as well as a large number of scales and valuable machinery were totally destroyed. Patterns were lost that took nineteen years to collect, some of which cannot be replaced, workmen's tools to the amount of \$800 were lost; and among other valuable machinery destroyed, were parts of the second set of pumps for the Hamilton water works, a pump for the Hamilton asylum, a set for the city of Kingston, also an 80 horse power engine for the Dodge Split Pulley Company, Toronto. The loss is estimated at about \$60,000, mostly covered by insurance. It is the company's intention to rebuild at once.

For cleaning any greasy machinery, says the *Milling Engineer*, nothing can be found that is more useful than steam. A steam hose attached to the boiler can be made to do better work in a few minutes than any one is able to do in hours of close application. The principal advantages of steam are, that it will penetrate where an instrument will not enter, and where anything else would be ineffectual to accomplish the desired result. Journal boxes with oil cellars will get filthy in time, and are difficult to clean in the ordinary way; but if they can be removed, or are in a favorable place so that steam can be used, it is veritable play work to rid them of any adhering substance. What is especially satisfactory in the use of steam is, that it does not add to the filth. Water and oil spread the foul matter, and thus make more work. It matters not how journal boxes are kept clean, everybody will admit that they should not be allowed to get dirty. They are sure to heat and give trouble if not cleaned and cared for.

When an employee is cleaning up machinery there should be a thorough understanding had with the proper persons regarding the starting up of machinery, and a man should be carefully on guard all the time, for fear somebody unacquainted with the circumstances might set the wheels running. Where these precautions are not taken, says the *Northwestern Lumberman*, some one should be held responsible for a killing which results. The owners and foreman of a plant should come in for their share of censure. Both should issue standing instructions on such points, and use every effort to have them carried out. A man who indulged in carelessness about machinery by which the lives and limbs of operatives were endangered, should be promptly discharged in most cases, no matter how skillful a workman he may be. An employer can well afford to lose a few good men in the interest of discipline and safety, and the lesson might prove of considerable benefit to those discharged.

Selkirk Lumber Co., 3,500,000; Brown & Rutherford, 1,500,000; Robinson & Co., 1,150,000; Jonason, Fredrickson & Walkley, 1,500,000; Meaghans mill, 350,000; Jos. Drake, 500,000; Woods & Co., 300,000; Brouse & Co., 500,000; Total, 9,300,000.

The Lumber men's Association has appointed Messrs. John Donogh and A. K. McIntosh a committee to obtain the endorsement of the Council of the Toronto Board of Trade to their request for fair treatment in the matter of freight from the Grand Trunk Co. Should peaceful effort to have their grievances remedied prove futile, it is understood to be their intention to carry the matter into the courts.

The Ontario government is advertising timber berth No. 2 in the township of Ballantyne, which will be put up at auction December 11 by the crown lands department at Toronto, the purchaser who bid the limit in at the sale of limits in December last having failed to comply with the conditions of sale. Particulars as to locality and description, area, etc., and terms and condition of sale will be made known on application, personally or by letter to the crown lands department, Toronto.

A Kentucky shipper writes that a good many dollars have been saved him by a notice which he has used over a year, attaching it to invoices. It gives the freight rate at which lumber has been guaranteed through to its destination, and requests consignees to insist that the shipment be delivered to them in accordance with the accompanying bill of lading, asserting that if the delivering road does not receive its due proportion of the freight money it has recourse on the road guaranteeing the rate.



PUBLISHED MONTHLY,

BY

CHAS. H. MORTIMER,

Office, 81 King Street West,
TORONTO, - - CANADA.

ADVERTISEMENTS.

Advertising rates sent promptly upon application. Orders for advertising should reach this office not later than the 25th day of the month immediately preceding our date of issue.

Changes in advertisements will be made whenever desired, without cost to the advertiser, but to insure proper compliance with the instructions of the advertiser, requests for change should reach this office as early as the 2nd day of the month.

Special advertisements under the headings "For Sale," "For Rent," &c., if not exceeding five lines, 50 cents for one insertion, or 75 cents for two insertions. If over five lines, 10 cents per line extra. Cash must accompany all orders for advertisements of this class.

SUBSCRIPTIONS.

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.

The price of subscription may be remitted by currency, in registered letters, or by postal order payable to C. H. Mortimer. Please do not send cheques on local banks unless 25 cents is added for cost of discount. Money sent in unregistered letters must be at senders' risk. The sending of the paper may be considered as evidence that we received the money.

Subscriptions from all foreign countries, embraced in the General Postal Union will be accepted at \$1.25 per annum.

Subscribers may have the mailing address changed as often as desirable. When ordering change, always give the old as well as the new address. Failure upon the part of subscribers to receive their papers promptly and regularly should be notified at once to this office.

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.

THE *Lumber World* thinks the prices obtained for timber lands on the Ottawa at the recent sale were anything but satisfactory. The Governments of the Provinces having had their attention called to the matter, will no doubt advance prices high enough to suit the tastes of the most fastidious American buyer. But perhaps the *Lumber World* does not speak for American buyers.

It would be hard to condense into smaller space a statement of so much truth and importance to the young mechanic as the following, by a writer in the *American Machinist*: "We often see two young men start out in life with apparent equal advantages; one makes a success, and the other a failure. A perfect index of the cause, and usually the cause itself, is that one thinks of his work and the other of his wages."

THE news comes to us that manufactories are being established in the Southern States for the manufacture of bagging cloth from "pine-straw." It is proposed to substitute this new material for jute bagging for covering bales of cotton. We do not know whether it will be found possible to make this new material out of the Canadian pine tree, but if so, the value of our pine lands will thereby be increased and a new and valuable industry secured to the country. Who will be the first to make the experiment?

THE additional duty lately imposed by the Dominion Government on saw logs exported from this country to be manufactured into lumber in United States mills, has aroused among Michigan mill owners a spirit of retaliation. They are asking their Government to increase the import duty on Canadian lumber entering the United States. We do not anticipate that their wishes will be acceded to. By increasing the import duty on Canadian lumber to please the Michigan mill owners, the United States Government would strike a serious blow at the interests of a large number of Americans who have recently purchased tracts of timber land, and engaged extensively in the manufacture of lumber in this country.

OUR Buffalo contemporary, the *Lumber World*, thinks that "in the future it may come to pass that the freeing of lumber could be accomplished so as give the United States a share of the profit, but at present all the advantage in such arrangement would be on the side of Canada." The time will come when the advantage of free lumber will lie largely on the side of the United States. When that time arrives, the increased values and the greater supply will far more than recompense Canadian lumbermen for the loss of any present advantage which might have accrued to them had the United States import duty on lumber been removed. "Everything comes to those who can wait."

THE Chicago *Timberman* recently remarked, "The fact is, that irrespective of any tariff action, the work of importing Canadian timber to supply the Michigan mills will continue to grow year by year." Our contemporary probably has reference to the tariff action on the part of the United States. It failed to take into account another very important contingency viz, tariff action on the part of the Canadian Government, which, by adding another dollar per thousand to the export duty on logs, has checked the supply to the Michigan mills in a manner as sudden as it is effectual. We may add, however, that the Michigan mill-owners are at liberty to regard this commendable move on the part of the Dominion Government in the light of an invitation to move their plant over to the source of supply.

THE time for stock taking has come round again, and at our request, many of the leading manufacturing firms of the country have taken stock a little earlier than usual, and elsewhere in this number of the MECHANICAL AND MILLING NEWS they make known the result. A perusal of the letters which we publish should serve to encourage persons who have been disposed to heed the statements of those who throughout the present year have been trying to show that this country was on the verge of "blue ruin." The fact that manufacturers have done an increased business compared with previous years, shows we are making progress as a manufacturing country. It shows more than this. The owners of the mills and factories who purchased so much new machinery this year, are dependent upon the agricultural and other classes for their prosperity. The fact that they have added so largely to the equipment of their manufactories during the year, proves not only that they are fairly prosperous, but also that the farmers, artisans, &c., upon whom their business largely depends, are purchasing more liberally than ever, and therefore cannot be suffering to any considerable extent from the pressure of hard times. Local causes have tended to somewhat depress business during the year, chief amongst which should be mentioned the partial failure of last year's crop, in Ontario, and the failure, through mismanagement, of some of our banking institutions. Both these causes operated to lessen the amount of money in circulation, and make collections slow. Happily, these depressing influences have almost, if not entirely passed away, and the outlook for the new year is regarded as satisfactory.

CANADA is not doing so badly in the matter of increasing her population. The immigration figures show that while the population of the United States is in round numbers twelve times that of Canada, the number of immigrants who go to the United States in preference to Canada is in the proportion of about three to one. — DOMINION MECHANICAL AND MILLING NEWS. "Yes, but you must take into account one other thing. All those who come into the United States stay here, while many of those who go into Canada soon come to the United States. Another thing: The immigration figures to which you refer do not include the immigrants into the United States from Canada and Mexico, so your proportion of three to one is only a fancied proportion. Your authorities do not like to advertise the Dominion as losing citizens to the United States, and they do not keep account of the outgoing ones. For full information concerning the outgoing go to Sir Richard Cartwright.—*Milling World*. Our contemporary says: "All those who come into the United States stay here." Is this sentiment correct? Let us see: Mr. Duncan Sinclair, of Battineau, Dakota, writes to the *Toronto Globe*: "I am over three score and eleven years of age; all but four years of that time I resided in Canada, and during these four years I have resided in the territory of Dakota, and the knowledge I have acquired of the people and their method of working their institutions is such as to make me utterly opposed to the annexation of Canada to the United States, either politically or commercially, and I would warn the people of Canada to give a wide berth to such decoy ducks

as Erastus Wiman." The above is but a sample of many similar cases which have come under our notice. During the last ten years Canadians have been applying themselves with a considerable amount of success to the building of railroads and the development of their manufacturing and other interests. The energy thus displayed has resulted in the rapid advancement of this country in all its interests. The work has been done that will ensure greater and more rapid progress in the future than in the present. We are not only attracting a fair proportion of the immigrants who come to America, and retaining them, but many Canadians are also returning to the land of their birth, after having had an opportunity of comparing its advantages with those of the land of the screaming eagle. So far as Sir Richard Cartwright is concerned, it would be interesting to know where he gets his information, in view of the fact that no official account of the so called exodus is kept. Sir Richard is a politician, and our Buffalo contemporary need not go beyond its own country to discover how little dependence can be placed upon the statements of a politician, the goal of whose ambition is a seat on the Treasury benches.

THE plan of storing a mill as full of wheat as it will hold, in order to save the cost of erecting an elevator or warehouse especially for its accommodation, is a risky one. The danger from fire is obviously much greater in a building containing machinery, oil, waste, flour dust, lamps, etc., than in an isolated warehouse or elevator. This increased danger also makes it necessary for the miller to pay heavy insurance charges, which the storing of his grain in a separate warehouse would, to a great extent, relieve him of.

THE bonus hunter has been deprived of his occupation, and short-sighted municipalities of the pleasure of giving away their hard-earned dollars, by the Act which came into force on Nov. 1st, for regulating the granting of bonuses by municipalities. The principal provisions of the Act are: that in order to grant a bonus two-thirds of the qualified voters must vote in its favor, and there must also be a majority of the votes actually polled on the by-law placed before the ratepayers in its favor—this applies to the granting aid either to establish or to promote any manufacturing industry, or for lending money to such for the same object; that no municipality shall grant a bonus to anyone who proposes to establish an industry of a similar nature to one already in operation in the place, and which has been established without any bonus; that no bonus shall be granted by a municipality to secure the removal thereto of an industry already established elsewhere in the Province; that no municipality shall grant a bonus which would for its payment, together with the payment of any bonuses already granted, require an annual levy, for principal and interest, exceeding ten per cent of the total annual municipal taxation.

THE announcement is made in the daily papers that the Government will abolish the privilege of grinding American wheat in bond. If this is the intention of the Government, justice to the two thousand millers of Canada demands that the import duty on American flour should be placed at a prohibitive figure. We have no objection to the home market being reserved for Canadian farmers, it properly belongs to them; but the important interests of the millers are entitled to equal consideration. The protection afforded flour manufacturers under existing arrangements, is by no means equal to that enjoyed by manufacturers of other products. The import duty of 50 cents per barrel on flour is by no means a prohibitive one. This is seen in the glutted condition of the flour market in Canada at present—a condition which is due in a large measure to the great quantities of American flour which have lately been shipped to this country and sold at whatever price it would bring. The producing capacity of United States mills has become so great, that a foreign market must be found for a considerable proportion of the flour manufactured by them. England is a large consumer of American flour, but latterly the demand from that quarter appears to have declined. As a result of this, stocks have accumulated in the United States to such an extent that the large mills have agreed to cease the operations for a time, in hope that the market will regain its equilibrium. In the meantime, large quantities of American surplus stocks are being dumped on the Canadian market, and slaughtered for whatever price can be obtained. Thus the Canadian miller is left without a market, and is made to suffer from the consequences of unwise competition amongst American millers. Such a condition of things should not exist under our present policy of protection to home industries. There is in-

vested in the flour milling industry in Canada a vast amount of capital, which should not be allowed to be sacrificed to the cut-throat competition of foreign manufacturers. If grinding in bond were abolished, the farmers of Ontario and the Northwest would not be compelled to find a market four thousand miles away for their wheat, while the raising of the duty so as to exclude foreign flour would put in profitable operation again the wheels of hundreds of mills throughout Canada, and give employment to hundreds of men now idle.

We are pleased to observe that the *Toronto World* is fighting the battle of the Canadian millers in this matter. Speaking on the subject, that paper remarks: "There is still another wrong which ought to be made right as soon as possible, and that is, the admission of American flour here at the nominal duty of 50 cents per barrel, while Canadian flour is excluded from the States by a duty of 20 per cent. on the value, which with flour at present prices, is more than double what our duty is. This is an injustice to ourselves, outrageous, indefensible, and one crying for a remedy. The government is about to do justice to Canadian farmers by putting a stop to the grinding of wheat in bond; next let it do justice to Canadian millers by putting an extinguisher on the importation of American flour. To do this we need not resort to anything that our neighbors could call harsh or unfriendly. We have simply to make our duty on flour exactly what their own is—no more, no less. They will do the job, and will do it up brown, too." We regret that there is not greater adhesiveness amongst Canadian millers. It is by no means certain that the disadvantages under which they have been placed might not have been removed before now had they taken a united stand in support of their interests.

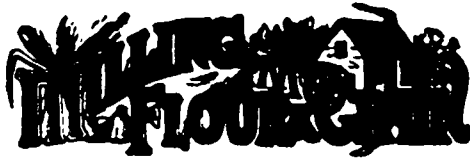
THE attention of millers and others using bags, is directed to the new half-page advertisement in this paper, of Messrs. A. W. Morris & Bro., Montreal. We are informed that this firm have already secured a large amount of custom for their new bag manufactory, and that their facilities for turning out a good article with the utmost despatch, are unsurpassed. Read carefully what they have to say in their advertisement, and write them for full particulars.

THE *Milling World* disputes our statement that "No. 1 Manitoba hard" wheat holds first position on the Liverpool market, and quotes figures from the *London Miller* which show that on a certain day in October Manitoba and Duluth wheat brought exactly the same price. Our statement was based upon a cable despatch which appeared in the *Toronto* daily papers. Admitting, however, that Duluth wheat stands on a par with Manitoba wheat in the Liverpool market, that fact does not prove that the best grade of the former is equal to the best grade of the latter. We were in error when we referred to No. 1 Manitoba hard wheat on the Liverpool market, as we have since been informed on reliable authority that not a bushel of first grade Manitoba wheat finds its way to the English market. Our total production of wheat of that quality has thus far been retained in this country for the use of Canadian millers. The Manitoba wheat exported is second grade, or No. 2 Northern, and this, our contemporary admits, holds its own with first grade Minnesota and Dakota wheat. In the language of our contemporary, "Honest comparisons alone will answer; honest statements alone will convince." The finest wheat in the world is grown in the Canadian Northwest, Yankee braggadocio to the contrary notwithstanding.

THE BEST.

THE best machinery, the best programme and the best managed mills do not necessarily do the best work with the best wheat. Everything may be ever so complete, but if the miller fails to comprehend, or for any reason to take advantage of that which is set before him, he will fail in doing good work. It is with the most delicate arrangements and adjustments for making distinctions in milling matters that the greatest mistakes may be made. With mechanical provisions for recognizing and caring for all the finer differences in the milling of the stock, there is required a mental provision for distinguishing the uses and necessities for such arrangement. There is no object in having a complete mill unless an equally complete man be chosen to run it. If the finer distinctions be made in the reduction of the stock and its ultimate grading and separations, it is only possible to have these distinctions preserved by operating the machine in the spirit and intention of the original designer. It is a frequent experience of mill builders that the mills with which they take the most pains, those which they study the most carefully, and in which they

make the most elaborate preparations for good milling, give them the most trouble. There is in mind a mill which was planned by a prominent and capable mill builder, which failed to such an extent as to reflect discredit on the firm which built it—not because it was inefficient in any degree, but rather because it was too good, too complete for the men who were to run it. They were not organized in a way to recognize or use its better points. One feature of this mill was the gradual reduction of middlings. These men could not see why these middlings should not be "crushed down" at once, and crush them down they did, and the consequence was that when they came to the place in the mill where they should have had their best middlings, they had a lot of flat, feathery stock, which made soft, flat, grey flour, instead of making the best flour in the mill. The builder of this mill was enough of a politician to see a way out of his trouble. He took out that gradual reduction apparatus as far as it applied to the middlings, and put in millstones, and the result was that the owners were happy. They were confirmed in the belief that smooth rolls would not do for the reduction of middlings and that the buhrs made whiter, more granular and altogether better flour.—*The Millstone*.



The big mill at Keewatin is now in running order.

Jos. H. Nitton, miller, Newbury, Ont., has sold out.

A flouring mill is wanted at New Westminster, B. C.

The oatmeal mill at Ridgeway Ont., is almost completed.

Messrs. Summerteldt & Sons have purchased the mill at Sutton West, Ont.

Mr. Martin Argell, of Newcastle, Ont., is putting some new machinery in his flour mill.

K. Chisholm & Co., mill owners, Brampton, Ont., are asking an extension from their creditors.

James Austin, Ingersoll, Ont., has begun building a mill on the site of one burned some time since.

Machinery is being put into the new elevator at Killarney Man., and is expected to be in operation very shortly.

Mr. W. Thompson, of Mitchell, Ont., who recently purchased the London oatmeal mills, has refused \$1,000 for his bargain.

A deputation of western millers will interview the minister of customs, Ottawa, on the subject of the grinding of wheat in bond.

Much dissatisfaction is being expressed by grain shippers at the inefficiency of the Grand Trunk Railway in removing grain.

Mrs. Gully will not venture out because she saw in the paper that "the bulls and the bears were having a lively fight on the street."

James Dunlop has purchased the Burns property on Catharine st., south, Hamilton Ont., and intends erecting a flouring mill on the site.

The opening ceremonies in connection with the starting in operation of the large new flouring mills at Rio de Janeiro were attended by the Emperor of Brazil.

In Ontario the weather has been favorable to winter wheat and reports are that the crops never looked stronger, with seldom a greater breadth sown than now.

The machinery for the new C. A. Young elevator at Deloraine, Man., has been placed in position. It will be run by steam, and includes a complete cleaning apparatus.

Chalmers Bros. & Bethune have converted their grain warehouse at Pilot Mound, Man., into an elevator, having a capacity of 10,000 bushels, to be run by horse power.

When the big C.P.R. elevator at Fort William now being constructed, and the annex to the old elevator are completed, the combined capacity of the three will be about 5,000,000 bushels.

Thessalon, Ont., wants a roller mill. Prospects are good and the council would assist the enterprise. All particulars will be furnished by addressing R. Sparling, editor *Advertiser*, Thessalon, Ont.

The Birtle Milling Co., will ask the council of the municipality of Birtle, Man., to submit a by-law to the ratepayers, granting a bonus of four or five thousand dollars to aid in the erection of a roller mill there.

R. Muir & Co., of Winnipeg, have accepted the offer of a bonus of \$6,000 and exemption from taxation for 20 years, for the erection of a roller flour mill at Treherne, Man. The mill will have a capacity of 125 barrels.

On Saturday, 17th November, the office of Sherk & Sneider's flour mills, Bridgeport, Ont., was entered by burglars and the safe blown open. They carried off about \$10.00, overlooking a drawer containing \$400.

The stock of flour in London, November 1, was about 475,000 sacks, Liverpool 76,723, Glasgow 82,664, and in Bristol 20,000 sacks, making a total of 54,000 sacks against 695,000 last year and 930,000 sacks in 1886.

The following have been appointed officers and directors of the Plattsville Milling Co., Plattsville, Ont.: President, H. Hoffman; Managing Director and Secretary, Geo. Sauer; Directors, Messrs. Hoffman, Sauer, R. Patton, J. Masters, J. D. Allen, J. H. Suckle, and Abe. Eichel.

The Glenelg flour mills near Alveston Ont., owned by W. & J. Greey of Toronto, were burned with their contents, 10,000 bushels of wheat, on the morning of the 8th November. The fire is supposed to have been caused by the explosion of a lamp. The loss will be over \$20,000; insurance, \$13,000. About 5,000 bushels of wheat were saved in various conditions.

A prominent Canadian miller who was staying in England in the summer, paid a visit to the Sun Flour Mill Co's. mill, at Waltham Abbey, which is on Simon's roller system, and has been described in these columns. Having returned to Canada, he now writes to Mr. Witherington, Mr. Simon's representative, asking for particulars and quotations for machines, remarking that "he considers that mill second to none he has seen on either side of the water for results."—*London Miller's Gazette*.

We believe the sieve bolting idea is a good one, says the *Millstone*, and that in the hands of proper, skilled mechanics, will come in to take a large place in a bolting scheme of the mills of this country, and that the apparent insurmountable obstacles will fade like the legions of others of the past. We believe that rapid strides have been made in this direction during recent months, and the proof of possibilities is now at hand. However, we do not advise any one to rush into a matter of this kind, but to wait and see the claims of all new ideas adequately substantiated before being taken up.

How many times have you heard millers say, a level-headed writer has said. "the quality of the flour is dependent upon the quality of the separations, and where one miller makes a better flour than another, he does it by making better separations; and in the ultimate result he gets the high grade stock into the high grade packer and the low grade stock into the low grade packer. It does not follow that because he makes a very high grade patent or clear that he throws the low grade into the feed pile; the making of superior high grade does not imply that questionable stocks are run into low grade or red dog. The same good judgment which makes a superior high grade flour will also discriminate and use the same methods with reference to the intermediate and lower grades."

A man who does not understand how to put up a mill building should never undertake it without consulting an expert. There are some very smart people in the world who imagine that what they do not know isn't worth knowing. They would undertake to build a mill as quick as they would attempt to build a cow-shed, and we know of some mill-builders, so-called, who should quit their present avocation and confine themselves to cow-shed building. We do not intend these remarks to apply to the gentleman who is overseeing the construction of the mill now going up in this city, but when we learned that he had not discovered, until a mill-furnisher had informed him, that not enough space had been allowed between floors in the second story of his mill to admit the reels and spouting, we felt like quoting for his benefit extracts from the A, B, C literature of some of our leading writers on mill-building.—*Modern Miller*.

It is stated that American spring wheat flour has recently been received in this city which to all appearances was perfectly sound. It formed dough with all the characteristics of its usual strength, but as soon as it was placed in the oven it fell as flat as a pancake, and this with other unmistakable symptoms we are informed, proved it conclusively to be flour, a portion of which was ground from frozen wheat. This would also appear to confirm the reports of frozen wheat in the American as well as Canadian Northwest. We have it upon reliable authority that a great deal of Minnesota flour has been ground from a mixture of frozen and sound wheat this year, and it is contended that the product therefrom cannot be distinguished from that ground from sound wheat, and that it is only in cases where the proportion of frozen wheat mixed with good is excessive, that any bad results can be detected. It is evident however that in the instance above referred to, the miller did not observe the precaution necessary in the process of mixing.—*Montreal Trade Bulletin*.

A writer in the *Northwestern Miller* says: "A decided improvement is noticeable in the mill using a suction on the breaks, over the mill not using one. The obvious purpose of the suction is to keep the flour dust from flying all over the mill when the reductions are being examined. More especially will the improvement in the mill be manifest if the fine flour taken out by the suction is kept out of the balers' and put into the low grade. The miller who has never used a suction on the breaks will be agreeably surprised if he will use one, to find how much better his breaks will work, as the dust is not only kept down but the heat generated by the different reductions is also carried off, and the possibility of the spoons and conveyors filling with dough and becoming sour is avoided. Thus the whole mill will work to better advantage. Several important points are gained by the use of such suction. The dust made by the reduction is saved and the mill kept cleaner. The fine flour or dust can be put into the low grade and better bakers' flour will be the result. An accumulation of heat is avoided and the rolls will work freer and better. The spoons, conveyors and elevators will be free from moisture, clean and dry, and last much longer and there will be less liability of having scouted or sour flour. This last trouble is the root upon which many a miller has wrecked his frail bark and was unable to tell the cause of his difficulty. Spoons, conveyors, elevators and reels imperfectly ventilated become sour and after standing a few days will scout more flour than the miller is aware of, thus causing him at times untold anxiety. It is by comparison of the different methods of washing flour that we are enabled to decide the relative merit of each. Thus, if it is found after experience that the mill will do better work, run easier, and be attended with more economy by using this peculiar appliance it would seem but wisdom to adopt it. Care should be taken in putting an appliance of this kind in the mill, for what might be made useful if properly constructed and suitably arranged might otherwise prove a failure."

The patent office at Washington, has granted Mr. J. H. Kilby, of Hamilton, Ont., a patent, on eighteen out of twenty-one claims made by him on a new and improved low-pressure exhaust steam injector, to feed steam boilers by the exhaust steam only, against the usual boiler pressure.

LUMBER PRICES.

Table with columns for LUMBER, CAR OR CARGO LOTS, and prices for various types of lumber like clear picks, shingles, etc.

Table with columns for YARD QUOTATIONS, listing prices for mill cull boards, shipping cull boards, etc.

Table with columns for MONTREAL PRICES, listing lumber prices for various species like Ash, Birch, etc.

Table with columns for NEW YORK PRICES, listing white pine prices for various sizes and types.

Table with columns for EASTERN SPRUCE, listing prices for different sizes of spruce lumber.

Table with columns for SHINGLES and HEMLOCK, listing prices for shingles and hemlock lumber.

ALBANY, N. Y. PRICES

Table with columns for SHINGLES AND LATH, listing prices for shingles and lath.

Table with columns for HEMLOCK, listing prices for hemlock lumber.

Table with columns for PINK, listing prices for pink lumber.

Table with columns for BUFFALO AND TONAWANDA PRICES, listing prices for lumber from these areas.

Table with columns for NORWAY PINE-ROUGH, listing prices for Norway pine.

Table with columns for WHITE PINE-ROUGH, listing prices for white pine.

MACHINERY FOR SALE

LIST OF WOOD-WORKING MACHINES for sale by H. W. PETRIE, Brantford. Includes 24 INCH Surface Planer, THREE Side Moulder, BROOM Handle Lathe, etc.

ONE Blanchard Spoke Lathe, Fay & Co.'s make. ONE New Axe Handle Lathe. POWER Morticer, Goldie & McCulloch, makers.

ONE Set of Spoke Machinery, Fay & Co.'s make. ONE small Wood Shingle Machine, Waterous make. 4 POLE Road Cars.

ONE Self Feed Lathe Machine, Waterous make. ONE Set of Box Nailing Machines. SAND Paperers, new and second-hand.

ONE Saw Mill Head Block, Galt make. ONE Fairbanks' Timber Gauge. HEADING Turner, Goldie & McCulloch make.

ONE Shingle Edger, with frame work. ONE Power Scroll Saw. TWO Self-Acting Shingle Machines, Quebec make.

TWO Shingle Packers, all iron. POWER Morticer, with Boring Attachment. WOOD Turning Lathes, several sizes.

DOUBLE Cope Tenoning Machine, Dundas make. DRAG Saw Machine, Goldie & McCulloch. POWER Morticer, Galt make.

NEW Blind Slat Tenoner, Galt make. NO. 4 Cant Gourlay Planer and Matcher. 24 INCH Pony Planer, Cowan & Co.'s make.

24 INCH Planer and Matcher, Dundas make. PLANER and Matcher, Michael's make, Detroit. NEW Eclipse Planer and Matcher, Galt make.

NO. 5 Planer and Matcher, Galt make. NEW Pony Planer and Matchers, only \$175. SEND for descriptive list, giving full particulars and mention wants. H. W. PETRIE, Brantford and Toronto.

SMITH'S Mercantile and Land Reporting Agency.

BANKERS DOMINION BANK. General Solicitor, JNO. LAY, Esq., Barrister, Toronto. Secretary—JOHN SMILKY, M.A. MANAGER—WILLIAM SMITH. General Offices—18 Court St., Toronto, Ont. Telegraph Address—Agency, Toronto.

Having for its special objects the furnishing to subscribers of reliable information on the financial standing or otherwise of traders and others, the collection of outstanding accounts, and the procuring of the most reliable information from independent source of the value and condition of landed and other properties in any part of Canada and the United States, with correspondents in Great Britain and other parts of Europe.

Another important feature in connection with this Department is, that subscribers depositing accounts for collection will, if requested, be furnished with a Form of Script, on which will be entered the name of each debtor, the amount owing, and a full report of the prospects of collection, and provided 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.

KAY ELECTRIC CO. MANUFACTURERS OF ELECTRIC MACHINES. Are and Incandescent DYNAMOS and LAMPS. ELECTRIC MOTORS, PLATING MACHINES, ANNUNCIATORS, CALL BELLS, MEDICAL BATTERIES, ETC. Cor. Bay & Market Sts., HAMILTON, - ONTARIO. Send for circulars and price list.

Victoria Wire Mills. ESTABLISHED 1859. Perforated Sheet Metals, Steel and Iron Wire Cloth, WIRE GUARDS FOR MILL WINDOWS, ETC. B. Greening & Co., HAMILTON, ONT. Send for Catalogue, mentioning your requirements.

ELECTRIC LIGHT IN SAW MILLS.

THE rapid introduction of the electric light into northwestern saw mills, marks and emphasizes the progressive and practical spirit of the lumbermen of this region, says the *Wood Worker*. The use of electricity in saw mills began before the systems and devices which are now in common use had been brought any where near perfection, and it has gone on steadily until a considerable proportion of the first-class mills in the white pine district are supplied with apparatus adequate to the task of turning night into day. New plants are in process of installation all the time, however, and beyond question the light companies are likely to drive a brisker trade the present fall and coming winter than they did a year ago, even, when the work they did was very heavy. In point of fact, a modern mill can not be called fully equipped without the electric lighting system. Even if night runs are not regularly necessary, there is always a time toward the end of the season when it is impossible to do a full day's work by daylight, and when the absence of artificial light renders it necessary to lose a good deal of time that is usually the most valuable of any in the season. A number of mills have this season put in plants for no other purpose than to be able to make the most lumber they could during the season with a single crew, and with no intention of attempting night work this year at least. No doubt they can figure on a good profit on the investment in the saving of time that it will enable them to make. When it is desirable to increase the capacity of the mill without adding to the extent of the plant, the use of electric lights is the readiest, cheapest, and indeed the only means to the end in view. For a comparatively nominal expense, an operator can provide himself with two mills where before he had but one, and be able to count as certainly upon the additional capacity acquired as if it consisted of an entirely separate plant. The old objections to gas and oil lights has no force against the electric illumination. It is claimed, and doubtless upon substantial grounds, that as much and as good lumber can be made by the electric light as by that furnished by old Sol himself, an assertion which seems reasonable when the brilliancy of the illumination it gives is considered along with the fact that it can be so placed that the sawyer can have the full force of it on the face of the log. In dark weather a saw mill is not the most brightly lighted place in the world; but at night, since the electric light came into vogue, and the improved systems of using it were generally adopted, there is nothing to be said against the quantity and quality of the light that is available. If the superiority of the electric light over all other systems of illumination needed any demonstration, it could readily be had in any saw mill where the former is in use.

A CAPILLARY STEAM BOILER.

AT a recent meeting of the French Society of Civil Engineers, in Paris, M. Serpollet is reported to have described his new tubular boiler, for which he claims that it cannot possibly explode. The boiler consists simply of a solid-drawn steel tube, which has, with the exception of its two ends, been rolled out flat, so as to leave it in a channel only 0.1 to 0.3 mm. wide. The tube is then coiled spirally, and its inner end is bent up vertically to receive the steam pipe, while the feed pipe is screwed into the outer end of the spiral. This spiral tube boiler is placed into a furnace, which may be of the slow combustion type, and there is no need for either stop valve, blow-off cocks, gauge glass, or safety valve. The feed water, upon entering the capillary channel within the tube, is instantly converted into steam, and issues perfectly dry. The tube of a 1 horse-power boiler is 6ft. 6in. long, and when flattened out 4in. wide; its total heating surface is about 5 feet square, and it is said to evaporate 45 pounds of water per hour, with a consumption of 9 pounds of coal. The supply of steam to the engine is regulated by regulating the amount of feed water sent into the boiler, and for this purpose the inventor arranges the regulator of the engine either to act upon the waste cock of the feed pump or upon a sliding block, by which the stroke of the feed pump is altered. There being practically no water in the boiler, the regulations are said to be as precise and quick as with the usual types of engines. To stop the engine it is only necessary to close the cock on the suction pipe of the pump, or even the waste cock fully. A few days after M. Serpollet had brought this boiler before the Societe des Ingenieurs Civils, he showed the application of it to a steam driven tricycle in the streets of Paris. The boiler was carried behind the axle of the main driving wheels, and the engine was fixed under the rider's seat, which also contains a supply of water and fuel. A speed of 6½ miles an hour was attained over roads having 1-5

per cent. grades. The weight of the tricycle in service, but without the rider, is 3¼ cwt.

A NEW AND REMARKABLE GAS.

A NEW gas, possessing some remarkable properties, has been discovered by Prof. Thorpe and Mr. J. W. Rodgers, in the research laboratory of the Normal School of Science. It is a sulpho fluoride of phosphorus of the composition PSF_3 , and is termed by its discoverers thiophosphoryl fluoride. The best method for its preparation consists in heating pentasulphide of phosphorus with lead fluoride in a leaden tube. It may also be obtained by substituting bismuth fluoride for the fluoride of lead, the only difference between the two reactions being that the second requires a higher temperature than the first. Again, when sulphur, phosphorus, and lead fluoride are gently warmed together, an extremely violent reaction occurs, but if a large excess of the fluoride of lead be employed a tolerably steady evolution of the new gas occurs, the excess of the lead salt appearing to act as a moderator. It is an interesting fact, throwing considerable light upon the constitution of the sulpho-fluoride, says *Nature*, that it may be obtained by heating together to 150°C . in a sealed tube a mixture of the corresponding chloride—thiophosphoryl chloride, PSCl_3 , a mobile colorless liquid—and trifluoride of arsenic. The simple exchange of chlorine for fluorine here brings about a striking physical change, from a highly refracting liquid to a colorless gas. In the first place, it is spontaneously inflammable. If it be collected over mercury, upon which it exerts no action, in a tube terminating above in a jet and stop-cock, and the latter be slowly turned so as to permit of its gradual escape, the gas immediately ignites as it comes in contact with the air, burning with a greenish yellow flame tipped at the apex with blue. If, however, a wide tube containing the gas standing over mercury be suddenly withdrawn from the mercury trough, the larger mass of gas ignites with production of a fine blue flash, the yellowish green tint again being observed as the light dies away. Thiophosphoryl fluoride is readily decomposed by the electric spark with deposition of sulphur. If a quantity contained in a tube over mercury be heated for a considerable time, complete decomposition occurs, sulphur and phosphorus both being deposited upon the sides of the tube and gaseous silicon tetrafluoride left. From a spectroscopic examination, dissociation was shown to occur at the lowest temperature of the electric spark. The gas is slowly dissolved by water, and appears to be somewhat soluble in ether, but alcohol and benzene exert no solvent action upon it. Finally, the colorless, transparent gas was reduced to a liquid, somewhat resembling the sulpho-chloride, by means of Cailletet's liquefaction apparatus.

PUBLICATIONS.

We have received from the author a copy of "The Steam Boiler Catechism," by Robert Grimshaw, M. E. This is a practical and most useful book for steam engineers, firemen, owners and makers of boilers of any kind. It treats of the properties of steam and fuel, and the theory and practice of designing, constructing, firing and repairing, and contains numerous illustrations explanatory of the author's ideas. The price of the book is \$2.00, for which sum it will be sent post-paid to any address by the publisher. Address the Practical Publishing Co., 21 Park Row, New York.

We are in receipt of a very handsome new catalogue just issued by Messrs. Wm. & J. G. Greey, proprietors of the Toronto Mill Furnishing Works. This catalogue numbers more than two hundred pages, and is superbly printed on heavy toned and callendered paper. It is illustrated with about three hundred cuts of machines manufactured and sold by this firm. The book is enclosed in attractive lithographed covers, on the front of which are shown the manufactory on the corner of Church and Esplanade Streets, in this city, together with several of the leading machines manufactured; and on the back, portraits of the late Wm. Greey, who founded the business in 1874, and of Messrs. John J. Greey and W. S. B. Lawrie, the present proprietors. The book bears the imprint of Messrs. Bingham & Webster, the well-known catalogue printers, of this city, and its pages reflect the excellence of the workmanship which is characteristic of that enterprising firm.

The Montreal water works, Louis LePage, superintendent, has now been in operation for thirty-three years, the original power being water. At the "wheel house" one of the original water wheels is still in use, which for thirty-three years has revolved under the pressure of water furnished by a canal. Steam was added in 1871, to be used when the water got low. The city, however, has outgrown the water-power service, and steam is used in addition.



The following composition is recommended as a good filling for a millstone: Melt some alum, and with every two lbs. stir in one tablespoonful of coarse brown sugar.

TO FIX PENCIL DRAWINGS.—First pass the drawing through clear water, go carefully over with skimmed milk, using a camel's-hair pencil, dip in a weak solution of alum, and let it dry flat. Allow a thin solution of isinglass to run over the drawing on perfectly level surface.

F. M. Stowe, of Winneconne, it is said, has solved the problem of tempering brass. He has shown a fine edged tool that will out a seasoned pine or hemlock knot without affecting the tool, and the various tests he has made proved it superior to steel for cutting purposes, as it takes altogether a finer edge.

A new way of annealing small pieces of steel is to heat the piece as slowly as possible, and when at a low red heat put it between two pieces of dry boards and screw them up tight in a vice. The steel burns its way into the boards, and on coming together around it, they form a practically air-tight charcoal bed. When it cools off the steel is apt to be found thoroughly annealed.

A new process has been devised for cleaning lubricating oil that has once been used, so that it can be used again. The oil is poured gently over a bed of iron which is strongly magnetized. The heaps of iron fragments constitute a magnetic sponge which stops all the particles of metal, especially those of iron. The oil is then passed through two hair filters and comes out perfectly clean.

The following figures show the amount of pressure required to unite the powders of the respective metals: Lead unites at thirteen tons per square inch, tin at nineteen tons, zinc at thirty-eight tons, antimony at thirty-eight tons, aluminium at thirty-eight tons, bismuth at thirty-eight tons, and copper at thirty-three tons. Lead flows at thirty-eight tons per square inch, tin at forty seven tons.

"Zinc water," said to be a sure fire-proofing material for certain woods, is said to be the production of a New England chemist who succeeded in finding a cheap method of dissolving zinc by combining it with hydrogen. Mr. Atkinson, the Boston economist and the English scientist, Sir Lyon Playfair, are quoted in connection with it, and predict for it a great future as a commercial product.

Since last May the most wonderful artificial light in existence has been that of the St. Catharine's Point lighthouse, in the Isle of Wight. It is an electric arc, produced between carbons 2½ inches in diameter, and it is estimated to be equal in illuminating to 7,000,000 candles. It is made to revolve, and every half minute a mighty flash of five seconds' duration sweeps around the sea, and is visible at a distance that seems incredible.

It is said that experiments have recently been made on Prussian railways with axle boxes fitted with bearings of vegetable parchment in place of brass. The parchment is strongly compressed before being used, and it is thoroughly dried to prevent subsequent shrinkage. An emulsion of water and oil, any of the mineral oils, is used as lubricant. The parchment soon becomes impregnated with oil, and is able to go a long time without a renewal of lubrication. It is between the body of the journal and the thin edge of the parchment segments that friction takes place.

In order to test the effect on the animal organism of the constant inhalation of dust in flour mills, M. L. Boisserie kept guinea pigs for two years in the most dusty part of a flour mill—that is to say, the department where the corn is cleaned from all extraneous matter by a special machine before being ground. Of twenty animals, ten remained alive at the end of two years. Those that died were mostly young ones. None of them showed traces of tuberculosis, but catarrhal pneumonia with profuse desquamation of epithelium; also in some cases localized interstitial pneumonia, and extravasation of blood. Dust, consisting of grains of starch, etc., was found more particularly on the nasal mucous membrane, but only to a small extent in the bronchi.—*The Lancet*.

A recent invention is Professor S. S. Webster's electrical fire on gine. It is worked by the current of an electrical wire. Each engine will carry on a reel about 500 feet of insulated fine copper wire, bound together, cable fashion, so as to equal a No. 3 wire, for transmission of the current. The engine, it is intended, shall be placed near the fire and the electrical connection made. The powerful current of an arc light wire will not be required, that of the ordinary incandescent light circuit being amply sufficient to run the motor. The great advantages claimed for the electric fire engine are: that it can be started at full speed; that it is light, that it costs one-third less; that it is noiseless, makes no smoke, sparks nor ashes; that it is safer and easier of control and economical. Where there are no electric light wires in the street to be tapped it will not be impracticable to run the engine by storage batteries charged from a dynamo at the engine house or at any other convenient point.

An important experiment for applying compressed air direct to a cupola furnace, for the melting of iron for casting purposes, was successfully carried out recently by the Birmingham Compressed Air Power Company. The experiment, which induced the attendance in Birmingham of nearly forty members of the South Staffordshire Institute of Engineers, took place at the iron foundry of Messrs. J. Cartwright & Sons, in New Bond street, and was superintended by Mr. Look, resident engineer of the company. Messrs. Cartwright state that, in the melting of five tons of iron, they saved one and a half hours in time, and they estimate that an economy of 40 to 50 per cent. will be effected in the cost of the process of melting. By the application of the air direct to the furnace, the engine, and consequently the engine, are dispensed with, and the apparatus can be regulated by the men in charge of the cupola, the danger of accident from the use of steam boiler or the use of machinery being avoided.—*Ironmongery*.

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ELECTRIC LIGHT AND POWER.

By "DYNAMO."

THERE is no industry which so thoroughly illustrates the wonderful age in which we live, as the manufacture of apparatus and machinery connected with the application of electricity, and more particularly that devoted to the transmission of light and power.

Electric light and power machinery has attained a high degree of perfection and efficiency, between 90 and 100 of the applied power being recovered in the practical operation of electric lighting plants, while the first cost of machinery as well as the cost of operating has been reduced to such an extent that few mills of any size can be found in which it is not used to a greater or less extent.

Insurance companies have begun to reduce the rate for buildings lighted by electricity, a most encouraging sign for the future progress of this most valuable adjunct to the mill or factory.

The first electric lamp of any power was made by Sir Humphrey Davy in 1808, but it is hardly 10 years since the first machine was constructed for producing a steady and commercially successful lamp or dynamo.

With incandescent lighting from the low pressure dynamos the important item is the distance over which the current is to be sent, as the weight of conductor necessarily increases with the square of the distance from the dynamo to the lamps.

In distributing any form of energy analogous to electricity, such as steam, water, gas, or compressed air, it is well known that the volume of current necessary to accomplish the same result would be reduced one fourth, and it would therefore require a wire one fourth of the first in weight. Such an arrangement is called the three-wire system.

Carrying this calculation still further, it will be seen that if the pressure be increased ten times, that the weight of conductor and consequent cost will be reduced one hundred times below that required in the usual low tension system.

This later achievement has been attained in the alternating system, which enables electricity to be supplied over distances heretofore considered impossible, and maintain the cost of conductors at a reasonable price as compared with the rest of the apparatus. Wherever the current is to be taken off of the wires, a converter or transformer is introduced which reduces the pressure to that required for the lamps, so that the current which enters the building has only the pressure of a low tension system.

All these problems have been carefully worked out and applied, and are in successful operation.

Hand and glove with the lighting industry and assuming gigantic proportions, is that of supplying power from central stations or utilizing distant water power for private purposes.

The dynamo and the motor have a combined efficiency of about 80% representing a loss not exceeding that in many long lines of shafting. The motor takes up about one fifth of the space of a steam engine of the same capacity in horse power, and there is no coal or ashes to carry back and forward or up and down stairs, nor bad odor, escaping steam, or shaking of the building by the pounding of a steam engine, and it is absolutely self regulating, using power only when doing work.

The electric horse of the 19th century is so thoroughly displacing the horse of flesh and blood of former times that it will be but a short time before the larger number of street railways will be operated by this seemingly superhuman power which already carries us up hills and round curves which are not attempted with the horse tramway, and at a saving of as high as 40% in the general running expenses, even where coal is used for the steam engine driving the dynamo supplying current to the electric motor.

We may have a dynamo and arc lamps for lighting our streets, mills and yards, to which if so disposed we may attach incandescent lamps of from ten to one hundred and fifty candle power.

We may have a dynamo specially adapted for running incandescent lamps to all candle power, at the ordinary low pressure of about 110 volts or for covering a larger area, 220 volts pressure as in the three-wire system, or by means of the alternating system, we may generate electricity at a high pressure and conduct it over a much wider field, and reduce it to the low pressure desired for interior lighting, while the electric motor can be turned out in sizes to run anything from a sewing machine to an electric railroad or an elevator.

There is an interesting process which is rapidly assuming large proportions, known as electric welding, by which the heat generated in conductors by the passage of currents of electricity is made to raise the pieces of metal to be welded, to a very high temperature and suffi-

cient to complete a union of the two parts, and not only iron and steel may be welded in this manner, but such metals as zinc, brass, cast iron, and other metals which have been considered incapable of being welded before this process was discovered, and dissimilar metals may be welded together in the same manner.

This apparatus may be attached to the same wires that light the factory or town where the alternating system is used.

THE PAPER BARREL.

A RECENT issue of the *Paper Trade Journal* contained the following description of the paper barrel as lately improved for storing and transporting all kinds of liquids as well as flour and other finely powdered substances: The walls of the barrel are composed of a series of paper blanks, provided in their longitudinal edges with a series of triangular or tapered notches or gores, so that the blanks have the appearance of a number of united barrel staves placed side by side. The first blank is placed upon a suitable collapsible core, and at its ends is secured to the beveled outer surface of a series of rings by means of cement or other adhesive material, the ends of the blanks extending to the outer edge of the rings. The sheets or blanks are placed in such a manner that the joints are not over each other, but alternately the solid portion of one blank covers the gores of the adjacent blanks. The several layers on the core are then pressed together by suitable means, and thus form a rigid shell. The core is then collapsed and covered, as the shell formed has sufficient strength and thickness to serve as core for the following layers.

The heads of the barrel consist each of two strong paper disks, secured to each other by means of cement or other suitable adhesive material, of which the interior disks fit precisely within the rings. The diameter of the outer disks is such that their rings are flush with the outer surface of the shell. Then more paper blanks or sheets are secured on the shell in the manner previously described, forming the thickness of the barrel and extending some distance beyond the outer edge of the disk of the heads. Strong paper rings are placed in the ends of the paper shell thus formed against the outer disk of the heads, and are cemented or secured by other adhesive material to the heads, and the projecting flush of the shell and the ends of the shell are turned off with the outer faces of the rings on the head. Before the heads are inserted the bung-hole is cut in the shell. Strong iron hoops or bands are then applied on the barrel, and the ends or heads are secured by means of screw clamps, and the barrel is then filled with linseed oil under pressure and in this way impregnated with oil from the interior toward the exterior. The remaining oil is then drawn off. The impregnated barrel is then baked at a temperature of 120° to 140° R. The temporary hoops or bands are removed, and then permanent bands or hoops are applied, and the heads may be secured by means of angle irons.

"THE CONCERN IS RICH; THEY CAN STAND IT."

THE above statement is heard pretty often, and it is safe to assume that the man who makes it is an unprofitable one to have in a mill. It may be that a belt is being mended, and the speaker has made a mistake, making necessary eight or ten feet of new belt. He makes the above statement to ease his conscience, but it does not pay for the piece of new belting.

A side of lace leather gets neglected, or is thrown over a steam pipe when repairs are being made. Next day steam is admitted to the circulation, the lacing is ruined, and the firm "stand it," just because a man was careless. A breakdown occurs, caused by neglect of a moment's work on a set screw with a monkey wrench. Again he "concern can stand it," for "they are rich."

It is evident that the man who makes the statement has no money invested in manufacturing, and it is also evident that he don't realize that the "concern" is growing poorer every day he is kept in their employ. There is no profit in keeping such a man, more than there is in maintaining any other nuisance. When an employe, be he superintendent or day laborer, is heard to pass his mistakes lightly, because "the concern is rich and can stand it," it is high time a change was made. That man never made the "concern" rich, neither will he help them retain their present standing. He is a weed, and must be weeded out.—*Manufacturers' Gazette*.

The Vancouver (B. C.) *World* describes a novelty in the shape of a portable grist mill on a sower which has begun work on False Creek, saying: "It is propelled by side wheels. The firm who own it have 300 tons of grist orders ahead for points on the Fraser. This ingenious idea will be of great benefit to the farmers in the district."

CANADIAN ASSOCIATION OF STATIONARY ENGINEERS.

PROCEEDINGS AT THE SECOND ANNUAL DINNER IN TORONTO.

THE second annual dinner of the Canadian Association of Stationary Engineers, held at the Grand Pacific Hotel in this city, on the evening of Nov. 14th, proved a sufficient attraction to bring together the largest gathering of engineers ever witnessed in Canada.

In addition to the members of the Toronto branch of the Association, there were present quite a large delegation from the Hamilton and Stratford branches, as well as invited guests not directly connected with the Association. Among those occupying seats at the festive board, we noticed the following: Mr. A. M. Wickens, president, Toronto branch; W. L. Oathwait, vice-president; M. J. Wallbridge, and Wm. Sutton, secretaries; J. Harrison, E. Nash, Wm. Nash, James Langdon, Wm. Sweet, of Hamilton; J. H. Weir and J. Hay, Stratford; T. Rousthorne, Bolton, Eng.; P. Myers, C. F. Kinsey, S. Malcomson, F. C. Smith, C. Mosley, W. H. Reveley, C. David, W. Lewis, Alex. Calder, R. H. Pugh, W. G. Blackgrove, J. Hughes, J. H. Venables, J. Mooring, F. Hanner, J. H. Ruddy, Frank Sutton, H. Oathwait R. Dixon, J. Dinckley, F. Mountstephens, Jos. Queen, R. Davison, H. Stevens, J. Galbraith, J. McLaughlin, E. Farrants, F. Haselin, G. W. Grant, J. Gough, G. C. Mooring, J. Cosgrave, G. Saunders, L. A. Perkins, J. L. Buchner, Jas. Kay, Jas. Findlay, A. E. Edkins, Samuel Hess, J. Harding, Wm. Wadge, Jas. W. Ellis, Henry Edsall, Wm. Wattersson, Wm. McKenzie, W. J. Holbrook, Wm. Towell, Arthur Polson.

Hon. G. W. Ross, Minister of Education, and the Mayor of Toronto, sent letters regretting their inability to be present.

We but echo the sentiments of all present when we say that the provision made for the wants of the physical man was of the most satisfactory and satisfying character.

After due attention had been paid to this important feature of the proceedings, President Wickens briefly reviewed the aims of the Association, and the progress which had been made during the two years of its existence. He explained that the one object of importance which the Association had in view, was to make of its members better engineers, and secure for them as individuals and as a body, a higher plane in life. When the Association started, the manufacturers viewed it with suspicion, in the belief that it was only another name for a trade union. The trades unions, on the other hand did not approve of it, because it refused to fall into line with their attitude of hostility towards the employers. The Association took the view that the interests of employer and employee were identical. Efforts had been made to have an inspector of steam boilers appointed for the city of Toronto, and to obtain legislation which would raise the standard of ability required of stationary engineers. Neither of these objects had yet been accomplished, but it was hoped that persistent effort would secure them.

Mr. John H. Venables, replying to the toast "Canada, Our Home," referred to the wonderful progress made in engine construction during the last twenty years. When he first came to this country, engines and engine beds were made in sections; now the whole thing was one.

Messrs. Malcomson and Nash, responded to the toast "Our Sister Societies." Mr. Malcomson on behalf of the Association of Marine Engineers wished the Association success in its work, and as representatives of the Hamilton and Stratford Associations respectively, Messrs. Nash and Hoyt spoke of the success which had attended the establishment of branches of the Association in those cities. The Hamilton branch numbered 78 members, among whom were several employers.

The toast of "Our Guests," brought forth replies from Messrs. Smith and Langdon, Rousthorne and Findlay, (locomotive engineer.) The latter thought a good method of obtaining the required legislation would be to blow up a few old boilers. Some doubts were expressed however, as to the success of such a plan, in view of the fact that the numerous boiler explosions which occur every year through ignorance and neglect, destroying life and property, appear to have so little effect in bringing about a reform in men and methods. Mr. Langdon said that although he had been operating stationary engines for forty years, he had found the benefit of belonging to an Association like this, where an opportunity was afforded him of becoming personally acquainted with brother engineers, and comparing notes with them.

Prof. Galbraith, being called upon to respond to the toast of "Educational Interests," was of the opinion that he could not better employ the time than by acquainting the members of the Association with the steps which

were being taken by the Educational Department to provide means for the technical education of mechanics. After giving a definition of the phrase "technical education," he gave it as his opinion that the Government should not attempt to teach what could already be learned in this country, viz: The practical duties of the mechanic, but should rather give attention to the scientific side. Books filled with algebraic characters, were closed and useless to the ordinary untrained mind, and as these were about the only books to be had bearing on mechanical subjects, it was impossible for the young mechanic to properly educate himself. The speaker then proceeded to describe what he had seen in the course of his visit with the Minister of Education a few months ago to the Schools of Technology in the United States. Cornell University had a department of mechanical engineering, with all necessary appliances for teaching, and seven or eight teachers, specialists in their sub-departments. There were also one storey buildings for trade shops, with machinery and appliances for giving instructions in pattern making, carpentry, blacksmithing, machine shop and foundry practice. The object was not to make tradesmen of the students, but to familiarize them with the use of tools, and the best methods of working. There was also a drawing room, and lecture rooms where the theories of mechanics and mathematics were explained. An important feature of this institution was the engineering laboratory, which contained machines for testing the strength of steel, wood, and cements, the endurance of materials, lubricants, friction on bearings, etc. There were also engines for taking indicator cards. Lehigh University, another of the schools visited, differed somewhat from Cornell in practice. There, no attempt was made to teach a knowledge of tools, but the work was confined to mechanical theory and testing. An arrangement existed, however, by which the students were allowed to visit each day some of the factories in the vicinity and observe the actual methods of working. At the Massachusetts Institute of Technology, there were larger shops than at Cornell. There were also two classes of students. One class was taught mechanical theory and the other, practical mechanics. In Ontario, the object should be to retain only so much of each of the systems mentioned as was absolutely necessary. We should cut out the trade shops, owing to there being opportunities of obtaining the knowledge designed to be imparted in such shops. What was wanted, was a thorough theoretical mechanical course, and an engineering laboratory. Money should be voted for this. This laboratory should contain a 50 ton testing machine, for iron, steel and wood, a cement tester, and machines for testing the wear of materials, lubricants and friction. There should also be a steam engine to work under all its conditions. As there were so many varieties of engines in use, an arrangement should be made for exchanging one kind for another from time to time. What the intentions of the Minister of Education were he did not know. His own opinion was, that the School of Practical Science in this city should be made the University of Technical Education for the Province. The lower branches should be taught in the high schools, and in night schools, supported by the municipalities in the same way as the public schools. The night schools should be conducted by an engineer, mathematician, chemist, &c.

Mr. C. H. Mortimer of the MECHANICAL AND MILLING NEWS, responded to the toast of "The Press," while the "Ladies" found an able champion in Mr. M. Sutton.

Several excellent songs were sung at intervals by Messrs. Stoddart, Guest, Gough and Harrison.

The proceedings closed by singing the national anthem.

SKETCH OF THE PRESIDENT.

We are pleased to be able to present to the readers of the MECHANICAL AND MILLING NEWS a portrait and brief sketch of Mr. A. M. Wickens, the respected President of the Canadian Association of Stationary Engineers. Mr. Wickens was born at Brantford, Ont., in 1842. When he had attained the age of twelve years, his father died. A year later found him on a farm in the vicinity. After remaining three years he returned to town and entered the machine shops of the then Brantford Engine Works—now the Waterous Engine Works.

At the expiration of his apprenticeship, he went to Chicago, and worked in the old Chicago Engine Works, at the corner of Beech and Polk streets. Later on, he accepted a position under the United States Government, and was sent to the Western or river fleet, where he remained until near the close of the war. Returning to Chicago, he was persuaded to go into the live stock business with some friends in the Chicago stock yards, but as there was no machinery connected with the handling of stock, he was out of his element, and soon left to

enter a machine shop again, first at Beloit, Wis., in the Merrill paper machine works, then removing to Council Bluffs, Iowa, where, with the Hendry foundry he spent several years. In 1874 he returned to Canada and engaged with Messrs. Thomson & Williams, Stratford, Ont., remaining with them a year and a half. From Stratford he went to Guelph, and worked in Messrs. Inglis & Hunter's shop for a time, and afterwards for a lengthened period was in the employ of the Worswick Engine Co. in the same city.

For many years previous to accepting his present situation with the Globe Printing Co., of this city, Mr. Wickens was engaged in the erection of engines and mill machinery in all parts of Canada. Young beginners in the machinery line find in him a man who, out of a wide experience, is able and always willing to give them assistance and encouragement. Mr. Wickens married in 1866, in Chicago, a young lady from his native town. Three sons and three daughters are the fruits of their



A. M. WICKENS, PRESIDENT CANADIAN ASSOCIATION STATIONARY ENGINEERS.

union. Mr. Wickens' many friends we are sure will join us in the wish that he may live long and continue to do much for the advancement of mechanical science.

RECENT ADVANCES IN THE METALLURGY OF IRON.

THE metallurgists, evidently, have yet much to learn in understanding the influence of other elements in modifying the properties of iron and steel, says the *Manufacturer and Builder*. In respect of its extreme sensitiveness to the presence of the smallest appreciable quantities of foreign substances, iron seems to stand alone, and the possibilities which this fact opens to investigators are almost limitless.

The peculiar effects of carbon, silicon, sulphur and phosphorus on the physical properties of iron have long been known, and play an important role in its utilization. It has only lately come to light, however, that aluminium, in so small a quantity as the one-tenth of one per cent (that is, 1 part in 1,000), renders wrought iron and steel distinctly more fusible. More recently, the observation has been made that additions of this element to cast iron, in quantities from one-fourth of one per cent up to one per cent, produced most favorable effects, rendering inferior irons soft, and fitting them for foundry uses. Now manganese is coming to the front as a useful addition to irons and steels, and from various sources we learn that it promises to yield results quite as valuable as those obtained with aluminium. In a paper recently presented to the Iron and Steel Institute by R. A. Hatfield, of Sheffield, England, he claims to have obtained in experiments in making steel with a high percentage, of manganese, "results which are entirely novel, and appear to show the way to an absolutely new sort of metal for various purposes."

His experiments were made with the idea that steel with high manganese might give a hard material, but without the brittleness of spiegeleisen, seeing that the carbon would be much reduced. The results obtained show some novel features, which it will be of interest to briefly summarize: After many trials a material was produced combining great strength with hardness, but the puzzling and apparently paradoxical result was discovered that, although steel, if it may be so termed, with 4 to 6 per cent. of manganese, and less than ½ per cent. of carbon, was so brittle that it could be powdered under a hand-hammer, yet by adding twice this amount of manganese, just the contrary effect was produced, and a material was produced containing many apparently new properties, as compared with any iron or steel hitherto manufactured. Briefly, the material may be

described as follows: That containing from 2½ to 6 per cent. is extremely brittle in its cast state, then a return in strength gradually takes place, and, with about 9 to 10 per cent., a cast bar, 2½ inches square, can be bent considerably out of the straight without breaking. This continues up to about 14 or 15 per cent., when a decrease occurs in actual toughness, though not in transverse strength, and after 20 per cent. is passed, then a rapid decrease again takes place. It should be stated that these remarks apply specially to the material in its cast state.

"Manganese steel is not so liable to honeycombs as ordinary steel, and the addition of silicon is unnecessary. It is very fluid and can be run into thin sections, but cools more rapidly than ordinary steel, and its contraction is decidedly greater. The latter fact explains the reason of its piping and settling so much, both in the ingots and in castings; with proper heads or runners, however, this difficulty can be obviated. It is manufactured by any of the ordinary steel-making processes, the basis, *i. e.*, the material before the manganese is added, being preferably decarbonized iron (practically pure iron, Fe), or mild steel. The ferro-manganese is added in a molten state or very highly heated. The steel is then ready for casting into ingots or other forms."

DANGERS OF THE EMERY WHEEL.

A CORRESPONDENT writes as follows to the *Scientific American*: "We think you might do good service to your large circle of readers, many of whom doubtless use emery wheels, by calling attention to the facts of this case (or a supposed similar one), showing the dangers resulting from ignorance and recklessness. In this case, young Dunwald, who seems to have been more than usually intelligent, was trusted to buy his emery wheel, selecting the size he chose for the machine, put on one much too heavy, and running at a speed which subjected the wheel to a strain of more than twice that of the speed at which it was marked by the manufacturer as proper to be run, evidently not understanding that the "centrifugal strain increases as the square of the velocity." For this ignorance he has paid a severe penalty. In an experience of some 20 years in the emery wheel business we have seen a great many instances of this kind, in fact, have never found but one or two instances of broken wheels that could not be traced directly to carelessness or misuse. Other cases besides too high speed are as follows: Forcing wheels on the arbor; too small flanges, which should be at least one-third of diameter of wheel; one flange smaller than the other, the large one being concave; neglecting to put an elastic washer between flanges; screwing up flanges too tight, thereby straining the wheel; allowing emery wheel to get out of true: the arbor running loose in the bearings; letting work get caught between the wheel and rest, etc. The matter of speed is the most serious one, and we have been amazed at the reckless use in this respect. We often find parties running wheels at even double regular speed or four times regular strain. Our only wonder is that so few accidents happen. We would say that we think nearly all manufacturers test their wheels at least three times regular strain, and therefore consider themselves free from blame, and assume that the user is responsible for breaking."

CLOTHING FOR VARYING WHEATS.

SOFT wheat will require more cloth and coarser cloth than hard wheat. Soft wheat flour may have larger granules than that from hard wheat and yet not be so sharp in feeling. Flour bolted through a 9 or 10 cloth where the wheat is soft will not feel as sharp as when bolted through a 12 or 13 cloth with hard wheat. For this reason it is important that the bolting apparatus be so arranged that the flour be taken, in whole or in part, through fine or coarse cloth, as circumstances may suggest. There are two ways of doing this. The coarse cloth may be at the head, as is usual, and the finer cloth below; or this same arrangement, as to the coarseness of the cloth, may be reversed, and the last or bottom reel may be clothed with coarse cloth. For such an arrangement the reels above should each be clothed at the tail with scalpers of increasing fineness, which will bring the material to be bolted on the last reel or reels of a quality to be readily converted into clean, bright, sharp flour.

There will be times when the wheat is very hard that this will not be used at all, but it is not necessary that the flour should be bolted through a uniform cloth to be uniform in feeling as to its sharpness of flour is determined as much by its hardness as by its size. The granules may be large and soft and yet not feel sharp, or they may be hard and small and yet possess all of the granular elements of good flour.—*Millman*.

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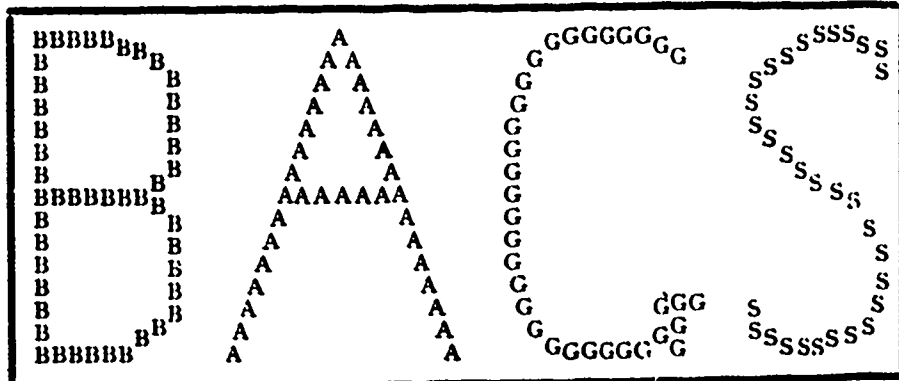
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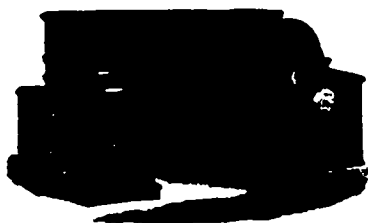
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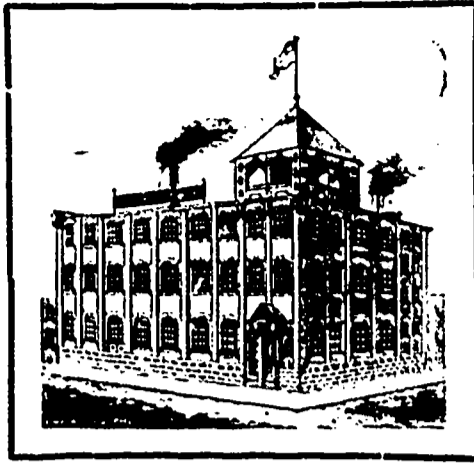
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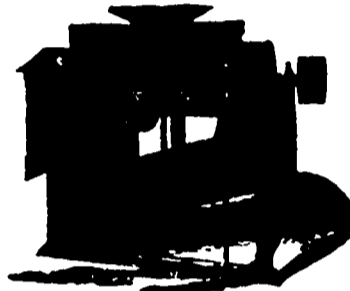
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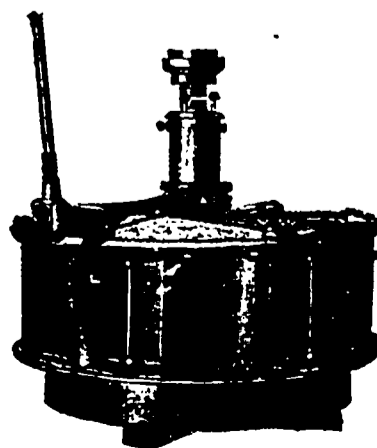
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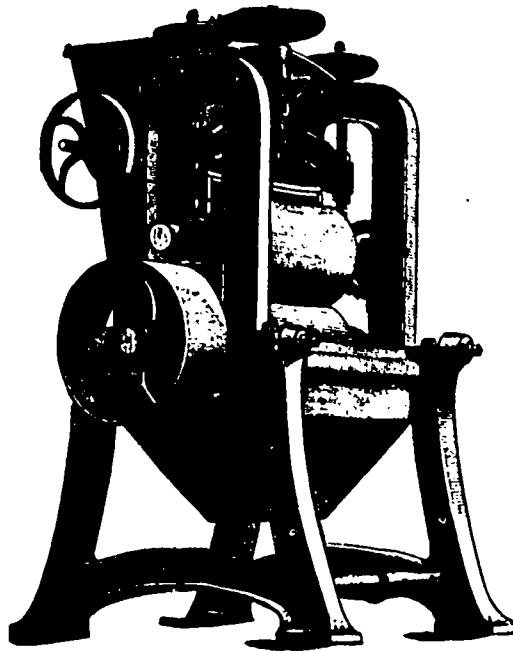
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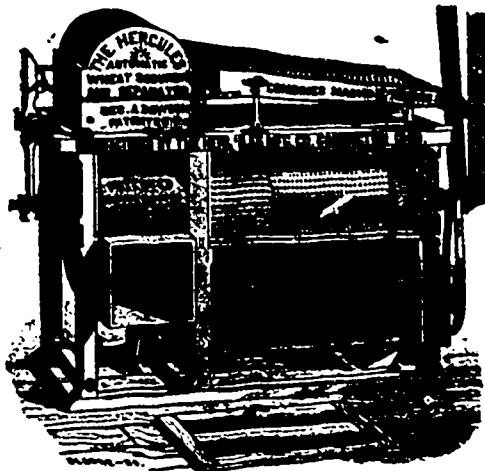
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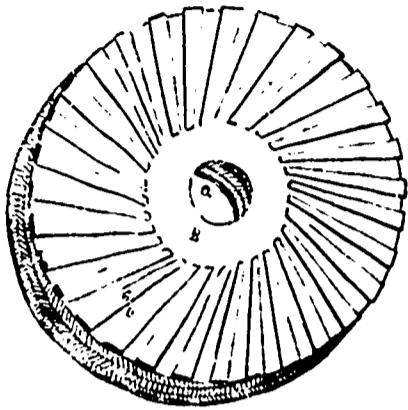
Mode of Covering Pulleys.

No. 29,809. Luke A. C. Fisher and John A. Galle, Toronto, Ont., and James Sangster, Buffalo, N. Y., U. S. dated 19th September, 1888.

Claim.—The herein described mode of covering pulleys, consisting in first cleaning the face of the pulley with an alkali, then covering its face with a series of courses of paper and cement, then securing by cement to the paper covering a covering of leather, substantially in the manner and for the purposes above described.

Mode of Dressing Mill Stones for the Manufacturing of Rolled Oats and Granulated Oat Meal.

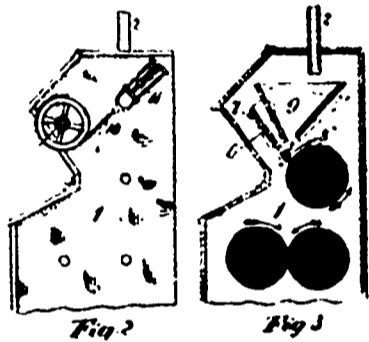
No. 29,708. Robert J. Fleming, Bothwell, Ont., 22nd August, 1888.



Claim.—Cutting down square of the front or grinding edge of the furrow D, as hereinbefore set forth.

Roller Mill Feed Hopper.

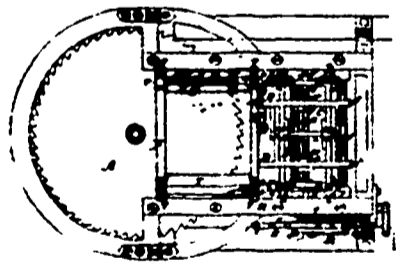
No. 29,806. William J. Purdy and John H. Lyons, Carberry, Man., dated 2nd September, 1888.



Claim.—In a roller mill, the combination, with the feed roller 8, of a hopper 9 connected to a feed board 6, endwise pivoted or journaled through the mill casing, a crank or wheel 19 on said journal to rock the feed board, and a spring tension regulator 11 connected to said level or wheel by a chain or cord 10, whereby the hopper when overcharged will overcome the resistance of the spring, and actuate the feed board to allow an abnormal quantity of grain to escape to the feed and reduction rollers until the tension of the spring overcomes the gravity of the hopper, the feed board then returning to its normal position.

Shingle Cutting Machine.

No. 29,820. Francis J. Drake, Belleville, Ont., dated 5th September, 1888.

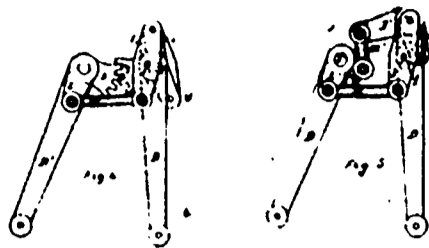


Claim.—1st. The rocking shafts of J, J1, having arms I fixed thereon, the said arms hinged to links which are connected with the tilt frame, as and for the purpose set forth. 2nd. The rocking shafts J, J1, one of which has a lever L, with a link and arm connection to the other, whereby each shaft may be simultaneously and alike rocked by moving the said lever, as and for the purpose set forth. 3rd. The combination, with the tilt frame, of the shafts J, J1, provided with connections to the said frame, and means for rocking the said shafts whereby the tilt frame may be raised or lowered to a desired height, as and for the purpose set forth. 4th. A quadrant K, mounted loosely upon one of the said shafts, alongside the said lever for locking and holding the latter at different desired points, as and for the purpose set forth. 5th. The combination, with the quadrant of a rod O pivoted to the said quadrant, and having a threaded end passing through a hand wheel, the latter being held to revolve in a box, whereby the said quadrant may be held rigid and swung upon its axes to various points, by turning the said hand wheel, as and for the purpose set forth. 6th. The tilts D, D1, separately made and hinged to permit each of adjustment, one independent of the other, as and for the purpose set forth. 7th. The yokes G, having inclined planes upon which they rest at right angles to and upon the tilt frame, and provided at one of their ends with a set screw for adjusting their height under the tilts, as and for the purpose set forth. 8th. The adjustable yokes, in combination with and arranged to support the said tilts at various heights, as and for the purpose set forth. 9th. A spindle E1, having two jamb nuts, whereby the said spindle and cans can be adjusted under the tilts to lift the said tilts to various heights, as and for the purpose set forth. 10th. The combination of a rock-

ing shaft S and torsion spring T, the latter being coiled around the said shaft, so as to turn it, whereby the dog T1 is drawn back to release the said bolt, as and for the purpose set forth.

Duplex Engine.

No. 29,859. The Waterloo Engine Works Company, Brantford, Ont., (assignee of Harvey F. Gaskill, Lockport, N. Y., U. S.,) dated 15th September, 1888.



Claim.—1st. The combination in a duplex engine, of the valves, the valve-stems, the levers pivoted to the valve-stems, the adjusting screws for varying the throws of the valves, and connecting devices connecting one end of each lever with one set of pistons, and the other end of each lever with the other set of pistons, substantially as set forth. 2nd. The method of regulating the motion of a duplex engine having independent pistons, consisting in causing both sets of pistons to act about equally upon both sets of valves, causing the pistons to off set each other in their actions on the valves during one part of the stroke, and to re-inforce each other in their actions on the valves during another part of the stroke, substantially as set forth. 3rd. The method of regulating the motion of a duplex engine having independently moving pistons, consisting in causing both sets of pistons to act about equally on both sets of valves, causing said pistons to off set each other in their actions on the valves during the first parts of the strokes, and to re-inforce each other in their actions on the valves during the latter parts of the strokes, substantially as set forth.

LITTLE FOREWARNINGS.

By T. P. FARMER.

IT is the little events that govern the affairs of life. It is the little things continually turning up here, there and everywhere, that we have to battle with; at first mere specks upon the horizon, like topsail of some distant ship, they approach, grow and magnify in importance, until they culminate in either pleasure, profit, disappointment or despair. It is the little warnings unheeded that lead to greater things. In the shop, the mill, or the factory, little things mean much. It is "eternal vigilance," or sheer indifference, that soon brings about success or failure. The little jar, the little thump, the little rattle or the little squeak, all foretell something; and now is the time to look after them; a few drops of oil or the turn of a wrench may set everything right again; delay until to-morrow or next week, and possibly it will necessitate shutting down for a day or so to make some extensive repairs. A single pane of glass in a certain window of a large factory led to the discovery of a chain of events, each small in itself, but as a whole resulting in a loss of several hundred dollars' worth of goods. On a certain day, the inspector employed at the factory, rejected a particular line of goods as imperfect; on that same day a single window pane began to rattle; explanations regarding the imperfect goods were at once demanded, and resulted in placing the blame upon the operatives, and the discharge of a good foreman of that department; the next day the mischief continued, and the blame was shifted to the machines; but why a dozen or more machines of the same kind had all kicked up at once, was a conundrum.

After much deliberation, it was finally decided the trouble was caused by vibration, though not the slightest motion was perceptible, and the only thing in the whole building apparently affected, or to arouse suspicion, was the trembling of that single pane of glass that had worked loose in the putty, and which at first was attributed wholly to the unison of sound with some other sonorous body. It being in the early spring, the foundations of the factory were first examined, and in so doing it was discovered that a part of the masonry in the wheel pit (power being a large breast wheel) had settled. In digging down it was found that some of the small stones had worked out, leaving a large one in such a position that, when the wheel was in motion—it having been thrown out of plumb—caused this stone to tilt, and one of its corners to hit against the end of an old piece of joist, that for some unaccountable reason had been buried there, the other end of which butted against the foundation wall of the building, and on the same side having the window with the loose glass—though a hundred and forty feet away. One blow with a sledge, and the joist was knocked aside; from that moment the pane of glass ceased to rattle, and there were no more imperfect goods. It was clearly demonstrated that these delicate machines were rendered useless by a vibration so slight as to be imperceptible to the senses; it might have necessitated the loss of much time and money to discover the true cause of the defective goods, but for that little pane of glass.

As the object of all study and the end of all wisdom is practical utility, so the regard for little things is the foundation of the greater and final result. If the so-called "trifling affairs" are carefully looked after, never fear but what the large ones will receive proper attention. The lack of a little foresight in our make-up is a deficiency we all sadly regret; we readily see our mistakes when it is too late, and blame ourselves for our thoughtlessness. We deliberate as to whether we shall use screws or rivets to join those parts together; the decision is finally made, and when we are pulling off our boots at night, and thinking over the events of the day, we wonder why it did not occur to us to use bolts instead of either; they would have been so much better in the case of repairs.

Little things should be respected. I was once acquainted with a man who boasted that he would not be governed by little things, or bothered by what he called "petty annoyances;" that he would not stop in the street to pick up anything so small as a ten-cent piece; he would not gratify the little temptation; and still, a few years later, that same man begged of me, with tears in his eyes, to give him a dime to buy a glass of whiskey. He was not only governed by little things, but he had been beaten by them; and then, in his miserable condition, a ten-cent piece seemed almost the connecting link between life and death; for all his bravado, his disregard of little forewarnings brought him to a sad ending. Something equivalent to the turn of a wrench in his early days might have saved him.

Yes, it is the little things in this world that teach and direct us; life is made up of them; we are but little things ourselves. It is when from some mountain top we view the broad expanse, or, sailing across the mighty ocean, that we appreciate the sense of smallness, and compare ourselves to the grain of sand upon the shore. We come, we tarry a little, then pass away like the flower that blooms at dawn, only to wither at the close of day.—*American Machinist.*

A MILLER WHO IS WORKING TO JOURNEY UPWARD.

After a long rest among the dudes and dudines up North, I once more saddle my "bronco" and with "lariat" in hand, I start once more for the "trail." On my first day out I saw a small jet of steam and smoke arising out of a dilapidated building. I reined-in, dismounted, and went in to see if I could find one of my greasy brothers. Going through the small hole that answered for a door, kicking a coyote out of the way, and making my way to the boiler, I found an old dilapidated scrap pile with what had been a four-inch gauge, but the glass was broken and the pointer around against the pin. Finding no one around I lit my old pipe and concluded I would take a survey of the "layout." The safety-valve had a "draw head" of an old car for a weight, guyed on by two 2 x 4s from the roof. Engine was on the side of another boiler some distance off. The uppermost thought in my mind was, where was the "injeener." Sat down in front some time until the pointer went back to 40. I heard a shuffling in among some cobs, when out came the worst specimen of an "injeener" that I ever had the misfortune to meet.

"Hullo, my friend, are you the engineer?"
 "I am the high cockalorum of this layout."
 "What makes you carry such pressure?"
 "Pressure on what?"
 "Why, on the boiler, of course."
 "Got to carry enough to make the engine run."
 "But when I came in you had 100 pounds, and now you have only 40, and the 'engine' runs."
 "Yes, but you see I run the whole business; am injeener, miller, roustabout, in fact, am the only man in the building, and when I get the hand around to the starting point I goes in the mill and wait on customers. When she begins to draw I throw off the feed and come out and whoops her up agin."

"Why don't you hire a good man as engineer and let him put this plant in a decent shape? Are you not afraid she will blow up some day?"

"Wall, stranger, I will tell you. I hired one of them bon-ton fellows once and paid him \$2 per day. He put in all his time cleaning up; wiping up grease, brushing out dirt, and after he got her cleaned up he made a seat and would do nothing but set and whittle; would not help me carry in any grain or pick stones, in fact he get so darned lazy he would not come out and pinch up an ear, when I told him he could go. But stranger, the pointer is around whar it started and I must go and tend on feed."

For fear the mill would be fed next I went also. Look out for fun there some noon.—"Cowboy," in *Boston Journal of Commerce.*

THE "CASE" SHORT SYSTEM OF MILLING.

INGLIS & HUNTER,

Sole Licensed Manufacturers of the following list of FLOUR MILL MACHINERY:

The "Case" Celebrated Roller Mill, with Vibratory Feed.

The "Case" Cornmeal System.

The "Case" Inter-Elevator Bolt as applied to the Hexagon Reel

"Aug Heine" Silver Creek Flour Bolt.

"Aug Heine" Silver Creek Centrifugal.

"Morse" Cyclone Dust Collector, for all purposes.

We caution millers and others to look out for infringements on the above class of machinery, as we are fully protected by broad patents on all these machines.

We are now prepared to give special attention to changing HEXAGON REELS TO THE "CASE" INTER-ELEVATING SYSTEM reducing the number of breaks, increasing the capacity, and dispensing with a large amount of machinery, thereby producing much better results in every respect, with LESS POWER.

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"BODMER" BOLTING CLOTH,

"AVERY" STEEL ELEVATOR BUCKETS,

COTTON, RUBBER AND LEATHER BELTING,

WHEAT CLEANERS AND SEPARATORS.

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Grain Cleaners and Elevator Separators,

Mill Irons of all descriptions, Corliss Engines, Boilers, Marine Engines and Boilers, Compound, Condensing and High Pressure.

Estimates given for building new and also for changing over old mills to the most approved and advanced method now known.

Correspondence solicited.

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INGLIS & HUNTER, ENGINEERS, ETC.

No. 6 Strachan Avenue,

TORONTO.

Bloomfield, Nov. 20, 1888.

Messrs. RUNCIMAN BROS.

Gentlemen,—In reply to your enquiry as to how I like the Hurford Bolts which you put in the new mill you built for me. I have much pleasure in letting you know that they are giving perfect satisfaction, and are without doubt the best bolts I have ever seen.

The Cochrane Roll is also doing her work just as you guaranteed to me that it would, and with the Hurford Bolts and Cochrane Rolls combined, I think you have given me one of the best 75 bbl. mills in Canada, and I will also take much pleasure in showing any parties who may call on us, just what we are doing.

Yours truly,

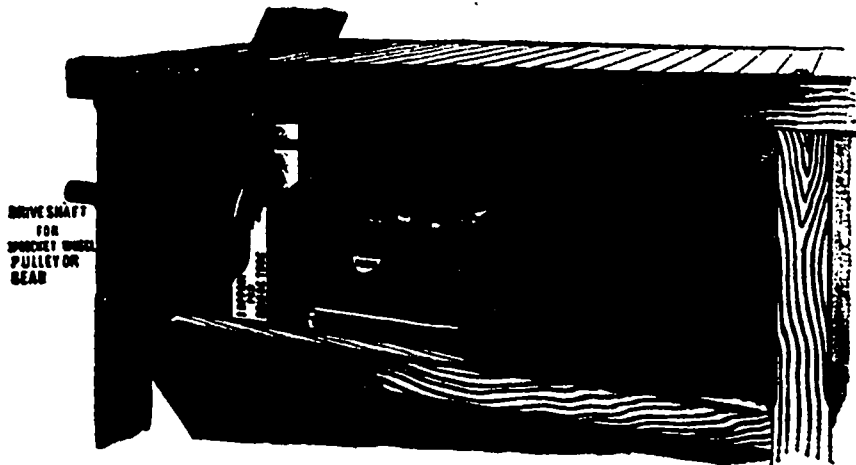
M. B. BURR.

I can fully endorse the above.

H. S. BULL,
Head Miller.

HURFORD BOLT AND SCALPER

The only Round Reel with inside brush,
and no Round Reel will do satisfactory work without it.



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Preferred by mill experts as the VERY BEST.

Was selected for driving the large Kooawatlin Mill.

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

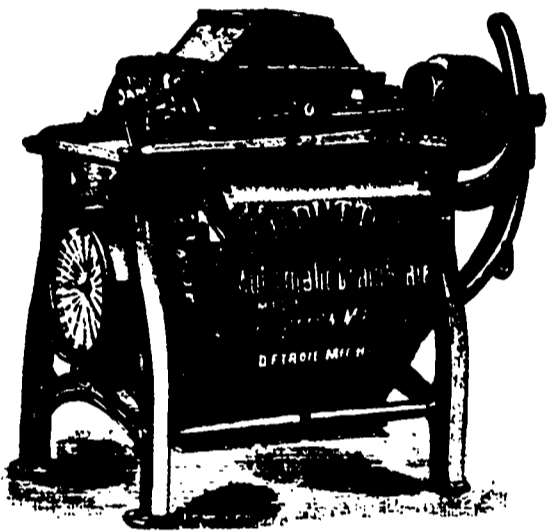
E. P. CAVE, ROLLER MILL BUILDER TRUSTLTON, ONT., writes:

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Manufacturers for the Patent in Canada.

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Patent Automatic Grain, Flour and Feed Scale.



Accurate and Reliable at all times. Will guarantee them to weigh as accurate as a Fairbanks or Howe Scale. Machines sent on 30 days' trial, subject to above guarantee. We make Scales ranging in capacity from 50 to 10,000 bushels per hour. Please send for circular and price list.

J. B. DUTTON, - Detroit, Mich.

J. B. DUTTON, City.

DETROIT, MICH., Dec. 16, 1887.

DEAR SIR,--After a thorough test of your Automatic Scale placed in our Malt House on Oct. 16, 1887, we can say that it is a perfect success in weighing and registering grain. We weigh both Barley and Malt alternately. Malt being such a very difficult product to weigh through an automatic scale owing to many roots, we had doubts of the scale handling it successfully, but are pleased to state that it gives us first-class service in every respect, so much so, that we have discarded a Fairbank's Hopper Scale and use the Automatic in preference.

Yours very truly,

THE HOWARD & NORTHWOOD MALTING CO.
(Signed) Per Wm. Northwood, Sec.

F. E. DIXON & CO.

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President COCHRANE MANUFACTURING CO.
HAMILTON, ONT.

PETERBOROUGH MILLS. ROLLER PROCESS.
— OFFICE OF —
Meldrum, Davidson & Co.,
Merchant Millers.

PETERBOROUGH, Sept. 20th, 1888.

Dear Sir,—In reply to yours asking a report of how we were satisfied with the Cochrane Roll placed in our mill by your firm, we would say that, after fifteen months' trial, running night and day, we feel that we cannot speak too highly of them, either for light driving or in their operating on the grain in such a way as to get the very best results, financially or otherwise.

As you are aware, we have same roll surface and number of rolls as our former belted mill. Saving in power in Cochrane Mill, fully ONE-THIRD, or an INCREASE IN OUTPUT, using same power, of FROM FORTY TO FIFTY BARRELS PER DAY. This has been clearly substantiated. Its advantage does not stop here, but through the uniformity in speed of both grinding rolls and feed rolls, together with the fact that there are no belts or anything else to put the rolls out of train, the WHOLE STOCK IS MORE GRANULAR and a much LARGER PERCENTAGE OF "MIDDINGS" is the result, which means a LARGER PERCENTAGE OF FIRST PATENT FLOUR. Any practical miller cannot help but be satisfied of this by examining into the merits of the two mills.

It is a MUCH LESS EXPENSIVE mill to keep up, from the fact that there are neither belts nor gears to keep up and repair, except the main driving belt and a pair of gears at the head end.

We are satisfied the mill HAS ADDED LARGELY TO OUR PROFITS since putting it in—which is the best recommendation we can offer—and consider that Mr. W. F. Cochrane deserves the thanks of the milling public for giving a new idea of such practical value to millers. Hoping you may be as successful as you deserve,

We are, yours truly,

MELDRUM, DAVIDSON & CO.

READ what one of the most successful millers of Western Ontario repeats :

The W. F. COCHRANE ROLLER MILL SUPPLY CO. [Limited.]
DUNDAS ONT.

INGERSOLL, Ont., 30th Sept., 1888.

Dear Sirs,—Yours to hand and noted. You ask what I think of my W. F. Cochrane Mill. I beg to say I know it is a grand success as to power and also to uniformity of grind, fully all you can get for it. My millers think they have a mill about fifty years ahead of the best. I cannot see how it could be any better. You can invite any one to come here and see a seven inch belt driving four pairs of 9 x 24 inch Rolls, and as loose as a belt can be and stay on the pulleys. I am satisfied I could drive it with a four-inch belt and make two hundred barrels of flour in twenty-four hours. We will take great pleasure in showing any one the mill that would like to see it at any time.

Yours respectfully,

WM. PARTLO.

Their verdict is supported by that of V. Denne, Newmarket, as it will be by all Millers who keep up with the times and order a Train of Cochrane Rolls from the sole licensees and manufacturers,

The W. F. Cochrane Roller Mill Supply Co. (Limited.)

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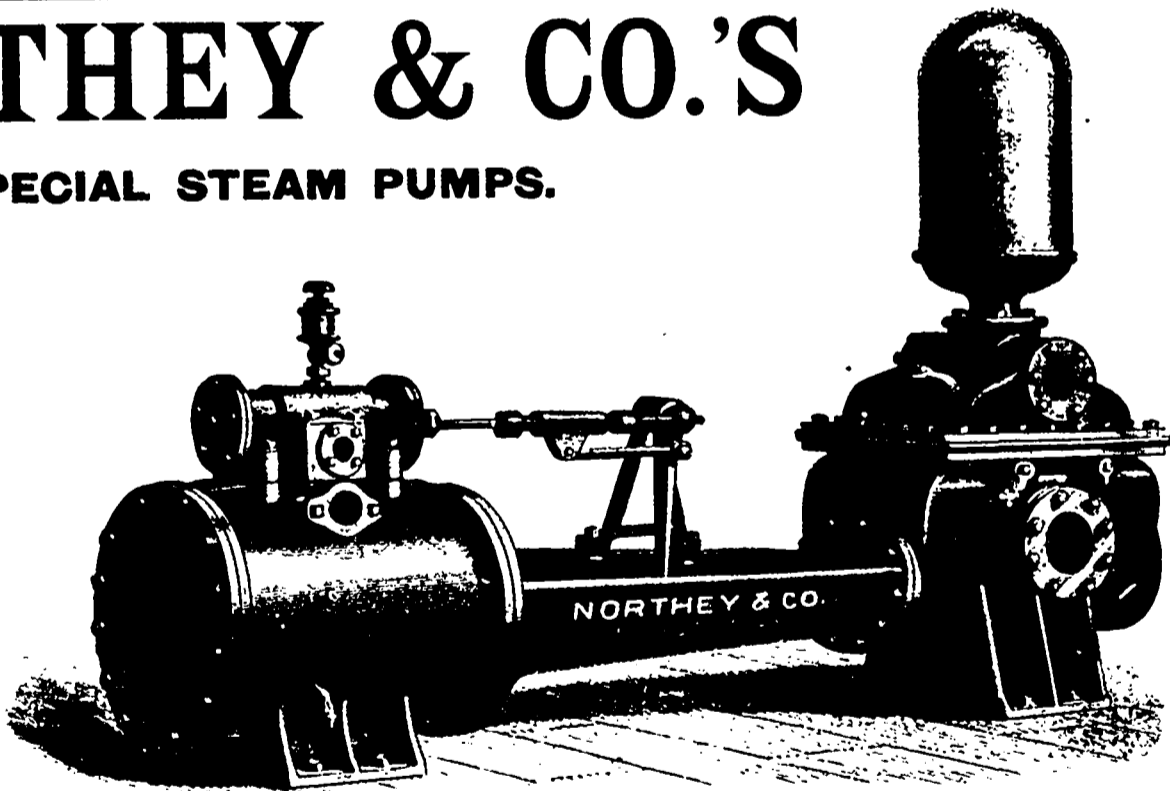
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