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THE DOMINION MECHANICAL & MILLING NEWS

Vol. X.—No. IV.

TORONTO, ONTARIO, APRIL, 1888.

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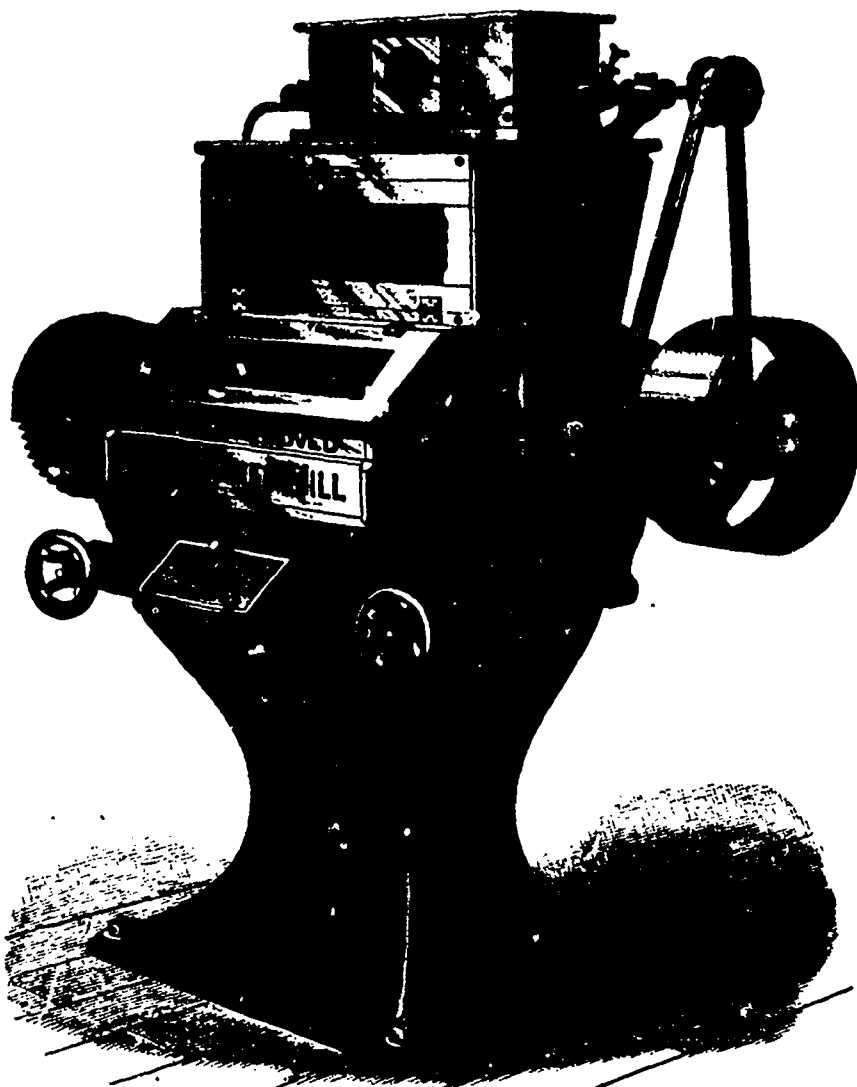
GREEY'S LATEST IMPROVED SINGLE ROLLER MILL.

THE above machine, an illustration of which is herewith presented to our readers, has a solid cast iron frame. The rolls are placed at a height convenient for levelling, adjusting and examining the operation of same. The adjustable roll is over-hung, affording great leverage for the tempering spring and hand wheel adjustments, and is readily levelled in line by a positive and convenient method. The spring serves the double purpose of permitting the rolls to spread when any hard substance comes between, and of taking up any lost motion or wear in the adjustments. The throw-out lever spreads the rolls apart when desired, at the same time slightly expanding the spring, and when brought together again, accurately and positively restores the previous adjustment. The adjustment for tempering the work of the rolls is certain, and can be regulated to a nicety. The hand wheel for operating same, owing to the great leverage, can be easily turned, no matter how great the roll pressure. All working parts are provided with means for taking up any looseness caused by wear.

The machine is fitted with the celebrated Sperry feed which is automatic and vibratory in its action. The adjustments for securing the even distribution of stock the whole width of roll surface are most perfect and sensitive. The method of applying the brushes and scrapers for keeping the surface of the rolls clean, and of regulating the pressure of the same against the roll, are simple and easy of adjustment. The rolls are driven with belts on both ends, and are so arranged that the belts are open belts on both ends, and the tension of both belts can be regulated without leaving the side of the rolls. They are also made with gear on one end, if desired. The gear used is either noiseless wood and iron tooth gear, or accurate cut iron gear.

The hand-hole is provided with automatic dust-tight door, and is conveniently placed for examining the operation of the rolls.

Further particulars regarding these machines will be cheerfully supplied on application to the manufacturers, Messrs. Wm. & J. G. Greey, 2 Church St., Toronto.



GREEY'S LATEST IMPROVED SINGLE ROLLER MILL.

SAWDUST AND SHAVINGS.

OF all mill offal sawdust and shavings are considered nearly valueless in localities remote from populous centres. The common impression is, even in a city like Chicago, that the detritus left by the saw and planing machine is almost worthless. But such a notion is very erroneous. Shavings and sawdust are commodities as marketable in the city as wheat or coal. In fact, at the present time, they are remarkably quick selling kinds of property. There is not enough of either dust or shavings to meet the demand. Dealers are actively engaged in drumming among the mills for enough to supply their customers. This renders the market speculative, and gives the dealers a chance to realize profits on scales. The scarcity of dust and shavings is so pronounced that the mill men have become fully aware of it, and are now putting up prices on the dealers and consumers. Sawdust has become so precious that it suggests that other kind of dust of great value with which the creditors are required to "come down." And there are different kinds and grades of sawdust as well as of other products. The softer the wood out of which dust is made, the less valuable is the dust. For instance,

in the summer, when the mills are running, pine dust can be had at \$1.50 a load; in the winter prices stiffen, and go up to \$3 a load. Hardwood dust, even if made of the meanest kind of timber, always commands high prices, ranging from \$5 to \$7 a load; ordinarily, though it has been sold in this city as high as \$10. A load of hardwood sawdust is about two cords, so it will be seen that the purchaser gets a large quantity for \$5 or \$10 as the case may be. This suggests that hardwood dust at \$2.50 a cord would not be very expensive fuel. If Smith's compressor could be brought into requisition, and the

for high priced drinks. When a man steps on the sawdust in a saloon, he may know that he can get a whisky for a dime; if his foot grates on sand he may conclude that his snifter will cost him 15 cents. Thus even the dust under one's feet in a rum shop indicates rank and degree.

Immense quantities of sawdust are used in ice houses, fish markets, and in every industry where it is necessary to use ice. For some reasons not explainable, there is a scarcity of sawdust for ice house purposes this winter. A lumber commission house, in

December, received an inquiry for a car load of sawdust from a man in Wisconsin. He evidently thought that a Chicago lumber dealer could furnish anything made of wood, even to the chewings of a saw. A box maker of this city recently received an order from Peoria for several car loads of dust, thinking that it could be furnished immediately. But the box maker was unable to meet the demand.

The shavings trade is largely controlled by regular dealers, of whom there are half a dozen or more in this city. They contract for shavings at the usual rates of \$1.00 and \$1.25 a load, and peddle them out for kindling, etc. Some of the planing mill owners burn their shavings under their boilers in place of other fuel; but the shavings dealers consider this a great waste of valuable material. One dealer exchanges soft coal for shavings; that is, he furnishes coal for generating steam in a mill if he can be allowed to cart away the shavings that would otherwise be burned.

The planing mill and box factory owners derive a considerable revenue from the sale of shavings and dust. One receives \$1,200 a year; another, \$2,500; a third \$1,700. A single box factory disposes of \$500 worth of kindling wood every month. The sale of the offal of planing mill and box factories is a great help to the operators in making a profit out of their business. As a general thing they complain bitterly about low rates for mill work, and the lack of resulting profit. Some of them say that if it were not for sale of dust, shavings or kindling wood, they would have to bank their fires and quit operations, but this is doubtless drawing it rather strong.—*Northwestern*

Lumberman.

The Millers' Union of New York City will make an effort to organize all the millers, millwrights and stone dressers in the State into one organization.

Mr. Gibson, member of the Ontario Legislature from Huron, has introduced a bill to amend an old statute which declares that no owner or occupier of a mill shall demand or take a larger part of the grain brought to be ground or bolted than one-twelfth part thereof for grinding and bolting. The Act was passed in 1792, and since that time has never been amended. The roller mills refuse to be governed by this statute. These mills simply exchange flour for grain, and rarely, if ever, grind for the farmer the grist he takes to the mill. Mr. Gibson proposes to make the old statute apply to exchanging as well as to grinding.

Mr. John Reynolds, miller, of Stayner, Ont., succumbed to financial obligations last month. Mr. Reynolds' disappearance from the village was the first public intimation of his failure. In a letter to the village paper, he said: "As there may be some reports as to the liabilities, etc., (more or less astray), I would say the correct amount of claims of every description against me is about \$15,000, and to offset that the mill cost me over \$12,000, the stove factory over \$2,000, and the residence over \$1,500; the property altogether costing me close on to \$17,000. The value of loose property is about \$2,000. Mr. Reynolds suffered heavy loss by a boiler explosion which destroyed his mill a couple of years ago, and has since laboured under financial difficulties.

dust hammered into blocks, it would make excellent and economical fuel. Hardwood dust is used for smoking hams, because it emits a sweet smoke, and does not flare up into a blazelike wood, and is used in large quantities by the packers. In talking about hardwood sawdust, one mill operator on Twenty-second street was set thinking by the suggestion that it would almost pay to work all cull hardwood, of the cheaper kinds, into sawdust. He said the suggestion was worth considering, and he didn't know but he would try the scheme.

The shavings from planing mills are largely sold to the lime keepers. The Chicago Lime Company, whose kilns are at the big quarry, near Indiana street and Western avenue, contracts for the shavings of several planing mills. They are used for burning lime, being much preferred to cordwood. Shavings are also extensively used for stable bedding, as are large quantities of sawdust. Dust is the favorite carpet for liquor and beer saloons. It is a ready absorbent of filth, deadens the sound of treading feet, and softens the fall of the man who has let his thirst run away with his judgment. But sawdust on the floor of a saloon indicates a low rank; the swell liquor house floor is sanded, in consonance with the amount of "sand" that is necessary to pay

MILLING AT WINNIPEG.

By D. WYLLIE BUCHANAN.

SOME time ago I furnished the MECHANICAL AND MILLING NEWS with a brief sketch of the early history of milling in Manitoba, from the grinding of wheat by hand power with the aid of both stones and ordinary coffee mills, as it was done by the early Red River settler, to the date of the establishment of the first steam mill in what is now known as the Province of Manitoba. This first steam mill was described in the sketch referred to, but for present convenience it may be well to recall the dates. It was established in the year 1856, and was located on the Red River, within the present corporation limits of the City of Winnipeg. This mill, as noted in my previous letter, was destroyed by fire in 1862.

The second steam mill established in the Red River country was built by Andrew McDermot about the time of the destruction of the first mill by fire. It was also located within the present corporation limits of the city of Winnipeg, and occupied a location near McMillan's mill, which was burned a few months ago. McDermot's mill has been erroneously described by a recent writer as the first steam grist mill established in the settlement, whereas it was built at least five years later than the first use of steam in grinding wheat. To the late Mr. John Intester, father of the present sheriff, belongs the credit of introducing steam gristing, he having been instrumental in forming a company to build the first mill.

The machinery for the second steam mill was brought in by the same tedious overland route from St. Paul. This mill, like its predecessor, was intended for both grinding wheat and sawing lumber. The following particulars were learned regarding the McDermot mill from A. R. Chisholm, who had it leased during the years 1871, 1872, and 1873. Chisholm, who came to Winnipeg from Glengarry, Ontario, took charge of the mill in the spring of 1871. The mill had two run of stone. It was the only mill running that summer, and consequently business was rushing. People came from Pembina to the north and Portage la Prairie to the west to have their gristing done. There were several other mills in the settlement by this time. Robert Tait had in the meantime established a steam mill at Silver Heights, on the Assiniboine river, just outside the present corporation limits of the city, but on account of some damage to the machinery, it was not running that season. E. H. G. G. Hay had also established a small steam grist mill a short distance below Winnipeg, on the Red River, which was also idle at the time. The Hudson's Bay Co. had a water power mill at Lower Fort Garry, near Selkirk, which was idle on account of low water. Thus it was the entire Red River settlement was dependent upon the McDermot mill, with the aid of the wind mills, which were now going out of use with the increasing population. Only one grade of flour was manufactured, or rather, everything turned out was simply flour, regardless of grade. This flour brought the unvarying price of \$6.50 per 100 pounds, or just about six times the prices at which low grades of flour can now be purchased here. For grinding wheat the miller charged 25 cents per bushel, or half the price which the farmer now receives for No. 1 Manitoba hard. Wheat was quoted in 1871 at \$1.50 per bushel, bran at \$1.50 per hundred, and shorts at \$3 per hundred. There was plenty of wheat in the settlement, and the crush for gristing was so great that engagements were made two months ahead. Farmers were obliged to store their wheat till it could be ground, and for this purpose several buildings or sheds were used.

About this time several new mills were established in Manitoba. Two mills were established at Portage la Prairie by Wm. Smith and Logan and Edgar, respectively. Tait's mill was supplied with new machinery, and started running. A little later C. P. Brown built a mill at Gladstone. Chisholm retired from the McDermot mill in the fall of 1873, and shortly after it was burned down. Tait's mill was also burned. This latter mill was kept running during the Red River rebellion, by order of Riel. Flour was brought in from Manitoba during the first grasshopper plague, the crops having been eaten up. This was in the year 1867-68. At this time wheat for seed sold for 12 shillings sterling per bushel, with the influx of immigration after the rebellion, there was not enough wheat grown in the settlement to supply local requirements, and flour commenced to come in freely from Minnesota. The common way was to float it down the Red River in flat boats. Flour prices were somewhat reduced by these importations.

The next important move in connection with milling in Winnipeg was in 1876, when two mills were erected in the city. These were the Hudson Bay Co.'s mill and McMillan's mill. The history of the former mill is somewhat eventful. The machinery for the Hudson

Bay Co.'s mill was purchased from Noye & Co., of Buffalo, N. Y. It was brought down the Red River in flat boats, and first taken to a point about twenty miles up the Assiniboine river from Winnipeg, known as White Horse Plains. The timber was taken out for the mill, but it was decided to change the location. The machinery was again loaded on rafts and floated down the river to Selkirk, twenty miles below Winnipeg. This was in the year 1871, the machinery having been brought in during the previous year. Again the machinery was loaded up and brought back to Winnipeg. It was finally sold to J. W. McLane, who erected the mill in 1876. This mill was then looked upon as quite a giant enterprise. The building was made very strong and was 58 feet long, 38 feet wide and four stories high. It had four run of stone and claimed the most powerful engine (150 horse-power) north of Minneapolis, with all the latest improvements. At this time flour was coming in freely from Minnesota, and the competition was keen—so keen that the mill did not prove a paying speculation to the proprietor, and it was taken over by the Hudson Bay Co. two years later. Several other smaller mills had been established in the country, and at this time the number of steam mills was said to be about ten. Gristing had been reduced to 15 cents per bushel, and wheat was worth about \$1.00 per bushel. In 1884 roller process machinery was put in the mill, the construction of other mills on the roller system having cut off the trade. The Pray Mfg Co., of Minneapolis, was employed to do this work. At first only the partial roller system was used, but in 1886 the mill was again overhauled by the Pray Co. with a complete roller system. The mill now has a capacity of 200 barrels daily. An elevator was built in 1886, and in 1885 a switch of the C. P. Ry. was built to the mill. The output of the mill is largely made in the company's extensive trade throughout the West, and exportation to Eastern Canada is also carried on. In the history of the Hudson's Bay mill, nothing was heard of frozen wheat previous to the year 1883, and again in 1885.

McMillan's mill, as previously stated, was established in 1876 by D. H. McMillan. Mr. McMillan came from Collingwood, Ontario, in 1870, in command of a company of volunteers, under Colonel Wolseley. The mill was on a small scale at first, consisting of two run of stone but was gradually increased in capacity, until in 1880 it had five run of stone. In the spring of 1881 the mill was changed to the roller process, and given a capacity of 250 barrels. In the following year an elevator was erected, with a capacity of 50,000 bushels. In 1882 W. W. McMillan was taken into partnership, under the firm name of D. H. McMillan & Bro. Mr. McMillan is often looked upon as the pioneer miller of the present school. The mill was kept going steadily and a good trade was done both for local consumption and export up to last fall, when the mill was destroyed by fire. The firm built a roller mill at Qu'Appelle in 1885, which was for a time the furthest western mill in the prairie region. Since then a mill has been established at Regina, 40 miles further west. The Qu'Appelle mill is used mainly for the British Columbia and western trade of the firm. The firm have several elevators and grain warehouses at purchasing points throughout Manitoba, and since the destruction of their Winnipeg mill, they are using these in doing a grain shipping business.

In August, 1881, work was commenced at the large Ogilvie mill at Winnipeg. The mill was completed the following summer, about the same time McMillan's mill was ready for operating under the roller system. This fine mill, with a capacity of about 1,000 barrels daily was fully described in a previous number of the MECHANICAL AND MILLING NEWS.

The year 1882 it will be seen marks the introduction of roller process milling into Western Canada. From the small beginning of milling in Winnipeg, the industry has been briefly followed to the introduction of roller milling. But it has been within the last few years that the milling industry has made such great strides in this western country. New mills have been established at points all over the country, until now there are some twenty-five roller mills in the country, and several in course of construction. Probably not less than ten new mills will be erected during the coming summer. Between the year 1876 and the introduction of roller process milling, a considerable number of stone mills were established at points throughout the settled districts of Manitoba. Some of these stone mills are still in use, at points distant from the railways. Where the new process flour has been introduced, the stone mills have generally been obliged to close down. The machinery from some of these mills has been removed to distant interior points, where it will again do duty until communication by railway is opened up. Away in the far north Saskatchewan country and even beyond, some of these old stones are

now doing duty, and serving a very useful purpose. In Manitoba milling is by far the most important industry carried on, and it bids fair not only to maintain, but to increase its lead before all other manufacturing industries.

ROOM FOR IMPROVEMENTS IN MILL MACHINERY.

PERHAPS no startling "revolution" in milling should be expected in the next two or three years, unless the Cochrane system of driving rolls, recently described in the *Milling World*, should answer all the expectations of its inventor and advocates. The success of that system would not properly constitute a "revolution" in processes, as it contemplates no change in the present modes of reduction and purification, but it would be a most important "revolution" in the essential of cost; it would not be a "revolution in milling" so much as it would be a revolution in the expenses of milling. Occasionally a bumptious and ill-informed writer insists that perfection is reached and that milling machines can not be further improved. These same writers a few years ago insisted that buhrmilling was perfect and that the proposed change to rolls would result in costly disaster, but their ridiculous position then was shown in a strong light by the victory of the rolls, and our memory of their stupidity in the past leads us to suspect that they do not know it all now, any more than they knew it all then. Milling machines have reached a high degree of excellence and efficiency, but every practical miller knows they are not perfect, even now. Improvement is still needed and is still possible. Every time I visit a mill this fact is thrust upon me. The miller finds defects in the various machines, from separators to packers, and the wise man, who considers the machinery "perfect" and incapable of any improvement, should visit a dozen mills and make pointed inquiries about the work of the machines. In the majority of cases he will find that millers do not consider milling machines "perfect," even the best machines made by the best manufacturers'—*Milling World*.

HOW TO CONCENTRATE THE POWER OF SMALL STREAMS.

AT the Niagara mill of Bainton Bros., at Buchanan, Michigan, the stream does not furnish water at all times for their 25 horse power wheel, but the Firmus rope transmission enables them to utilize the water again by a second dam 1,100 feet down stream from the first, where a 25 H. P. wheel has been placed. A pulley is placed on the shaft of the last named wheel, and from this the rope travels first to a pair of mule pulleys on the tower, set on rising ground just above the bank of the pond. From these mules the rope passes in a straight line to the main transmission pulley on a countershaft at the mill, and intermediately supported on six sets of bearers. This countershaft is belted to the main line shaft and is provided with a clutch, so that the transmission may be connected or disconnected at will.

This example shows that it is easy to use the water over and over, and that the lay of the ground is of small importance. It is advantageous, of course to carry the transmission rope in a direct line all in one vertical plane, but deviations of direction are not of large importance. In the case illustrated, the rope was carried away laterally to the mules, in order to avoid setting one or more of the bearer towers in the lower pond, where they might be difficult of access in winter. The resistance encountered is that due to the weight of the rope on the bearer journals and the aerial friction on the rope. These are quantities so small that a man can, with one hand, move this transmission from a state of rest, when disconnected from the line shaft. A change of direction increases the journal pressure of the mules, but the rope may go over hills or down into valleys without other effects than increasing its length. Practically, however, inequality of the ground may generally be neutralized by putting the several bearers on the same level or nearly so.

The figures of this transmission are as follows:
Power to be transmitted 25 H. P., distance 1,100 feet, velocity of rope 3,125 transmitting 25 H. P.
would show the tension to be $\frac{33000 \times 25}{3125} = 264$
 $\times 80$ lb. (one half of the tension weight) equals 334 lb. total strain on rope, but there being two wraps, hence the strain will be divided by two, thus:
 $\frac{325}{2} = 162$ lb., which is about 5 per cent. of the breaking strain of a half inch Firmus rope. The breaking strain of Firmus rope is about 25 per cent. greater than manila.—*Power and Transmission*.



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BY

CHAS. H. MORTIMER,

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

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EDITOR'S ANNOUNCEMENTS.

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

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

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

SO far we have been unable to learn what advantage would result to the Dominion from taking Newfoundland into the Confederation. The disadvantages of the proposed union are more clearly discernible. It would be a wise plan to seek to populate and develop the territory we have, before adding to it a large unproductive area like Newfoundland.

THE Toronto Board of Trade has concluded that the bucket shop is an evil that should be wiped out, and has accordingly set to work to accomplish that object. In Chicago, Montreal and other cities similar crusades against bucket shops have resulted in closing up many of these places of doubtful business character. The bucket shop has ruined many young men and some older ones in this city during the last five years, and its extinction now would probably be the means of saving others. It is best that the bucket shop should go.

IN noting the fact that the town of Dundas has exempted from taxation for ten years the W. F. Cochrane Roller Mill Supply Co., the *Canadian Manufacturer* says: "This is one method of bonusing impecunious Yankee manufacturers, practised by some Canadian towns. This concern is abundantly able to pay whatever taxes there may be assessed against it, but the desire is to have others do so for them." It is difficult to understand how the company in question can be regarded as "impecunious Yankee manufacturers," when a large majority of its stockholders and officers are Canadians. Still more difficult is it to understand how a company can be "impecunious" and at the same time "abundantly able to pay."

WE scarcely need to direct the attention of our readers to the extensive advertisements of Messrs. Wm. & J. G. Greey appearing in this number. They are sufficiently conspicuous and interesting in themselves to claim the attention of the reader, and will well repay careful perusal. In walking through the workshops of this enterprising firm the other day we were rather surprised at their extent, perfect equipment, and the number of workmen employed therein. We were shown also a new department lately

fitted with roll-turning, cut off and boring machines, and hydraulic presses, for the manufacture of chilled iron rolls. The manner in which huge pieces of best quality American iron of great weight are by these machines transformed into rolls with smooth polished surface, is an interesting study.

IT is satisfactory to know that steps are to be taken to do away with the railway monopoly in the Northwest. It will be still more satisfactory to learn that the compensation given the C. P. R. will not be an unreasonable amount. The Canadian Pacific has fared well at the hands of the Canadian people—so well in fact, that popular indignation will be aroused should an exorbitant sum be demanded in return for the giving up of its exclusive privileges in the Northwest. That additional railway facilities are necessary for the present requirements and future development of the Northwest has been clearly demonstrated. The reports which have been scattered broadcast regarding the grain blockade, and its paralyzing effect upon the commerce of the country, have doubtless left an unfavorable impression on the minds of many. It will be fortunate if the news of a satisfactory adjustment of the difficulty can be as widely published before the tide of immigration for the coming season sets it.

A CASE which recently came before the courts in Toronto should serve as a caution to grain buyers. The agent of a well-known Ontario miller purchased a quantity of wheat from a farmer, and sent it to the mill, where it was ground into flour. Some months afterwards the miller was interviewed by a legal gentleman who asked him if he had not purchased from the farmer in question a certain number of bushels of wheat. The miller replied that he had. The legal gentleman then informed him that the firm of which he was a member had loaned the farmer a sum of money, and as security had received from him a mortgage on his growing crop; that therefore the grain which the miller had purchased belonged to his firm and not to the farmer, and that his firm would hold the miller liable for payment for the same. The miller refused to pay a second time for the wheat, and the matter was carried into court, where claimants produced the mortgage showing the grain to have been conveyed to them prior to its being cut. We are informed that the miller was compelled to pay for the grain a second time. In view of this circumstance, it is necessary that grain buyers should be on their guard against such frauds, and owing to the difficulty, if not the impossibility of discovering that grain offered for sale is free from liability, the legislature would do well to provide a penalty to be imposed on persons offering for sale grain, the whole or part ownership of which does not belong to them.

THE only men who appear to be making money rapidly these days are those whose creditors accept 25 cents and less on the dollar, payable in twelve or eighteen months. By such compromises men in business are clearing thousands of dollars and making it almost impossible for honest men to do a legitimate business and pay 100 cents on the dollar. In other words, the present method of dealing with insolvents is putting a premium on dishonesty. Is it any wonder, therefore, that crookedness in business methods prevails to such an alarming extent? It is high time that our legislators took hold of this matter and put a few thorns in the path of the professional failures. We know men who make an assignment every three or four years, and after compromising with their creditors start business again on a larger scale and apparently with increased capital. Other men we have known who started with little or no capital and launched out on such an extensive scale that they could never have intended to meet their engagements. In less than two years they failed owing twenty or thirty thousand dollars. Such men evidently start out with the purpose of defrauding those with whom they do business. They have nothing to lose and much to gain by making an assignment and compromising on a basis which allows them to pay a fraction of their indebtedness with their outstanding accounts, and have a handsome balance left with which to again commence business. The law should make such frauds impossible.

IT is pleasing to observe the interest that has been awakened of late in the subject of technical education. During the last month a large deputation representing the Marine and Stationary Engineers' Associations and the manufacturing interests, waited on the Attorney-General and Minister of Education, and urged the necessity of providing means for the instruction of youths and young men in the different branches of mechanical science. It was pointed out that while

instruction could be had in every other department of knowledge, young men desiring to fit themselves to become mechanical engineers, &c., were compelled to attend the schools of technology in Great Britain or the United States. The deputation urged that the curriculum of the high schools throughout the country might with great advantage be changed so as to include subjects of practical assistance and value to youths who intend to engage in mechanical pursuits. The reply given the deputation by the representatives of the Government was of a very encouraging nature. It was to the effect that the Government is alive to the necessity of making provision for technical instruction, and is at present collecting information with a view to establishing a school of technology in the city of Toronto. The Mayor, who, as one of the city's representatives in the Legislature, introduced the deputation to the Ministers, expressed the opinion that the City Council would be found willing to assist in establishing such an institution. A manufacturer, a member of the deputation, also offered to contribute personally to the object. Certainly those who desire that the seekers after mechanical knowledge shall enjoy equal facilities with students in other branches of learning, have cause for encouragement in the information given above.

THE discussion in the Ontario Legislature on Mr. Meredith's motion for the appointment of a select committee to enquire into the extent and nature of the timber and mineral resources of the Province, was a very interesting one, and, if it should serve no better purpose, will call attention to the great value of our timber lands, and the necessity of preserving them to the greatest possible extent. For our part we can see no sufficient reason why the Government should have refused to appoint the committee asked for, unless it be the absence from his place of the Minister of Crown Lands. The Minister of Public Works in opposing the motion, appeared to think that our forests were so boundless that the Government need be in no hurry to take steps to preserve them. This is not a very statesmanlike view of the matter. Even supposing that our forests should prove equal to the demands of another century, is that a good reason for allowing the destruction every year of millions of dollars worth of valuable pine? Will there be no one living in this country in need of lumber a century hence? We cannot tell, but it is the government's duty to assume that there will be. It should be borne in mind that the demand upon our forests in the future will be many times greater than in the past owing to the rapid depletion of American sources of supply. The United States must ere many years become a very extensive purchaser of Canadian lumber. In view of these and many other reasons which might be mentioned, steps cannot too soon be taken to conserve our forest wealth.

SOME American journals, for example the *Milling World*, of Buffalo, either knowingly or through ignorance of facts, are misrepresenting the position of Canada and the Canadian people. Taking their cue probably from the Commercial Union papers of Canada, these journals across the border are talking of the "hopeless, helpless condition" of this country and its people, and the dreary outlook for us unless we throw ourselves on the mercy of Uncle Sam and ask to be taken in out of the cold. Now talk of this kind is both cheap and nonsensical. True, we have causes of complaint, but they are probably not as serious as those which have been encountered and overcome by the United States and other countries. The Commercial Unionists, judged by the noise they are making, might easily be mistaken for the Canadian people, but are in reality a small minority of our population. Although the carrying out of their scheme would certainly mean our annexation to the United States, they are afraid to propose that as our proper destiny. If the Dominion were really in a "hopeless, helpless condition," annexation would be a popular shibboleth, but the manner in which Commercial Unionists avoid it shows that it is not. The people of Manitoba have suffered for want of sufficient railway accommodation, but that difficulty will be removed. That is probably the most serious ground of discontent existing in this country at present, and as we have said, it is in a fair way to be satisfactorily adjusted. We have a country rich in cereals, timber and minerals, a magnificent system of railways and canals, and rapidly developing manufacturing industries. Many of the mightiest obstacles in the way of our progress as a nation have already been surmounted, those still remaining will also in time be overcome, and a promising future awaits us even though we should sever our connection with Great Britain and decline to become a part of the United States.

McLAREN & SONS' NEW FLOUR MILL AT ARNPRIOR, ONT.

FOR the following description of the above mill we are indebted to the Arnprior *Chronicle*.

A brief visit to the Arnprior mills will repay any person who is a lover of fine machinery. The rolls are driven by an improved water wheel of 125-horsepower. On the first floor of the building are located seven stands containing fourteen pairs of rolls, five pairs of which are corrugated for reducing the wheat, or, perhaps, properly speaking, for the purpose of getting rid of the bran before commencing the skilful operation of reducing the remainder of the berry to flour, for which purpose the balance of the machinery, nine pairs of smooth chilled iron rolls, are utilized. These rolls comprise the celebrated Case system, and were manufactured by Messrs. Inglis & Hunter, of Toronto, under patents controlled by the Case Manufacturing Co., of Columbus, Ohio. The excellent adjustments and fine automatic feed of these machines contribute largely to the success of the mill. Upon this floor are also placed one separator, one Hercules scourer, one power flour packer and two hand packers. Through the centre of this floor there are five of the Silver Creek flour dressing machines, also made by the same firm, licensed under patents held by Mr. August Heine, patentee and manufacturer, of Silver Creek, N. Y. By adopting this style of a flour dresser the great objection of all centrifugal systems of bolting is overcome, which is high speed, and for this reason they are enabled to bolt clean flour on one number of coarser cloth than can be done on any other bolting device. There is also on this floor a Garden City first break scalper, with an aspirator, for the purpose of getting rid of a certain amount of impurities, loosened by passing through the first break rolls. The small particles of bran are effectually removed by the aspirator from the middlings before going to the rolls for further reduction. Here also are two G. T. Smith purifiers and one centrifugal reel for dressing soft material passing from the other machines on this floor. Adjoining these machines are four bins, flour packer, wheat bin, separator and wheat for feeding rolls. Upon the third floor, or attic, are placed six scalping machines, ten feet long, with two conveyors under each. Each of these machines is so arranged as to make three distinct separations, each of which is carried to its proper place for further handling. A bran duster and a shorts duster each performs its share on this floor in finishing whatever stock is sent to them. A cockle separator, placed over the wheat bins over the rolls, separates all cockle which may be left in the wheat after passing through the other cleaners before its reduction into flour. A system of conveyors carries all the different products, bran, shorts, middlings, etc., into their respective bins with great accuracy. In the basement of the mill, at the foot of the elevators, are lines of shafting for driving fast and slow rolls, also one Eureka scouring machine and a No. 2 brush machine. The capacity of these machines is from 40 to 60 bushels per hour. The north end of the mill, from basement to attic, is converted into a large elevator capable of storing 40,000 bushels of wheat. It is divided into four large bins, with elevators passing through the centre of the building, discharging into a revolving spout which can be directed into any bin required. Upon the first floor is located a receiving hopper placed upon a large scale, with a capacity of 70 bushels, from which the grain, when weighed, is deposited in a pit at the foot of the elevators. The machinery of the mill is driven by a 66-inch water wheel, of 125 horse power, under a full head of water. The mill is complete in every way, and is a credit to the town, its owners, and its lessees, Messrs. McLachlin Bros.

DEATH OF A FAMOUS ENGINE BUILDER.

GEO. H. CORLISS the well-known engineer and steam-engine builder, died at Providence, R. I., of paralysis of the heart and gastric fever, on February 21. He was born June 2, 1817, at Easton, Washington county, N. Y. He was never inside of a machine-shop before he was 25 years old, although he was at the age of 18 years a practical civil engineer. He moved to Providence in 1844, and in 1846 he began the development of his steam-engine improvements. In 1848 he completed one engine, which embodied the essential features of the present world-famed Corliss engine. Mr. Corliss won a large number of medals and had many honors conferred upon him. He carried away the

highest competitive prize at the Paris exhibition in 1867; he was presented the Rumford medals in 1870, the late Dr. Asa Gray, president of the academy, making the presentation; he won the grand diploma of honor at the Vienna exhibition of 1873, on the strength of foreign builders, who made exhibits claiming them as of the Corliss type, he himself not being present or represented or having any exhibit. The Monthyon prize for 1878 of the Institute of France, the highest honor of mechanical achievement known in the old world, was presented him. He has recently received numerous other valuable medals from foreign potentates and societies. Mr. Corliss was a commissioner for Rhode Island at the centennial exhibition, and one of the executive committee of seven that was intrusted with the preliminary work. His big centennial engine and system, devised by him for transmitting the power all over Machinery Hall, added to his fame. The undertaking cost him \$100,000 and stands as the most princely gift ever given by an individual to an international exhibition.

PLANING MILL OWNERS' TRIBULATIONS.

TALKING with a lumber dealer, a short time ago, about dressed flooring, ceiling, etc., and the awful time he had to get his lumber planed right, says a writer in the *Wood Worker*, set me to thinking of the time when as foreman of a planing mill in New York City I used to smile and look pleasant, when receiving some such note as this, delivered at the same time as the lumber, either by the truck driver or as an N. B. on the mill ticket: "Please run this lot with very slow feed, as the customer is very particular; or, 'put on new sharp knives so as to run this maple or oak very, very smooth, as any defects in planing will have to be thrown out;' or, 'any piece of lumber in this lot that you think is not



McLAREN & SONS' NEW FLOUR MILL AT ARNPRIOR, ONT.

good or will not plane perfectly smooth, please lay out, and send word to the office so we can send others to replace them;" or, "if any piece is too thin to hold the thickness, lay it out," and other requests of like nature.

Now, whenever any fault is found with dressed lumber, if it don't hold the thickness ordered, or just skins the hair off, or a split or check shows up, or a knot falls out, or the quality is not as good as expected, or the boards warp because a new surface presents itself to the air on either kiln-dried or partly dried stuff, the planing mill man gets it right between the eyes from the dealer. He either planes it too thin, or he planes it rough with dull knives. His men are careless and slam the lumber and split it on purpose, or they knock the knots out with a hammer, or they don't pile it right after it is worked, and of course he must make it good or else lose the work, or make an enemy of the yard if he doesn't make a reduction in his bill, for what is often no fault of his at all.

Why should he be blamed if the lumber is sold for 1½-inch when it is only 1¼-inch, or if 1½-inch and ordered to be planed just inside the lines, or just skin it, and the grit and dirt cuts the edge of the knives, so the knives are dull before the first piece is through the mill, or if the lumber is dropped from a 40-foot pile into ashes or oyster shells, or that a black, loose knot is sold for a sound one, or imperfections show up after planing? But he is blamed for all this and more too, just the same, and the innocent dealer goes for him to a greater or less extent, as his trade or work sent to the mill will warrant, or the mill man is dependent.

I was shown a lot of southern pine flooring, as a specimen of planing, done at a crack mill, nearly every length of which was gouged or tapered either on the tongue or groove edge, from three to six inches on one end, and the lumber dealer was saying all sorts of nice things of the mill that dressed it. I told him the mill was not to

blame in this case and showed him that the fault was in the lumber, caused by carelessness in edging in the saw mill where the lumber was cut. The boards had been run through very fast and allowed to swing before clear of the saws, and a short bend or split ahead of the cut leaving a stub, was on almost every piece; and if the short, rounding edge was fed next the guide on the planer, a taper end was the result; but if the hollow side was next the guide, a gouge or imperfect tongue would follow, and no planing machine could straighten these short kinks, or carry the lumber any straighter or do the work better on the badly-sawed lumber, than this lot was dressed. The dealer in question owned up that he had had trouble before with lumber cut at the same mill, and would write them to be more careful and do their work well even if the output was less.

A planing mill bill for a month's dressing, settled in full, without any deduction for spoiled, split, or shaly lumber, would cause a mill man to kick himself around the office to see if he was not dreaming, and before he could recover from the surprise would take off an extra ten per cent. for cash, receipt the bill and return thanks for the shavings.

ELECTRIC POWER OF COAL.

THE direct conversion of heat into electric work is a problem that continues to tax the ingenuity of electricians. What seems to be the most promising attempt at solution yet made is a new thermo-magnetic generator and motor devised by M. Menges of the Hague, it depends upon the fact that the magnetic metals lose their magnetic power when heated. It claims several important advantages, however, the chief being that the necessary alternations of heating and cooling are given automatically, and that the cores of the armature coils are relieved from changes of temperature.

STANDING BALANCE.

THE millstone is in "standing balance," but not in "running balance," says an exchange, and requires to be put in "running balance," without being put out of "standing balance;" and this can only be done by finding which side runs low and adding weight on the opposite side, as near the back of the stone as possible, of course adding an equal weight of lead on the low running side, as near the face as possible. The weight added near the face will tend to raise the low side and the weight on the back being above the centre of suspension, will depress the high side. A friend of mine, a very good miller, now deceased, succeeded in putting in a first run quality of stone into running balance, but was still dissatisfied, and he sent for me, although it was a journey of some 200 miles to his mill, to tell him what was wrong and put him right. The stones were up and beautifully dressed, both furrows and face, and perfectly true in face; he put the stones down, and was proceeding to put the covers on, when I said, "They are not in standing balance." His reply was, "If you alter it they will not run true." I said, "Yes, they will," so added the necessary weight (several pounds) to balance the stone, letting it into the stone near the line or rather below the line of suspension, so that it would have no tendency to either rise or fall. I don't say it is easy for a person who never saw it done to put a stone in running and standing balance (without boxes) when it is very far out (from being unevenly built). I believe that in this case the easiest way would be to put two temporary, very light iron hoops loosely round the stone, one near the back and one near the face and fix them with wooden wedges, and between the temporary hoops and stone securely place pieces of sheet lead until the stone would run true. Having thus ascertained how much lead was required, and where it was required, recesses could be made in the stone and the proper weight of melted lead poured in, the hoops and all the temporary appliances being removed, and the improved work of the stones will repay the trouble and cost at first dressing.

A writer in the *Practical Engineer* says an experiment was made as follows: New leather belts, made from the same hides, were put onto two engine lathes which stood side by side, and were used upon the same kind of work. One of these was thrown off every night, while the other was never released. The latter had to be shortened four times during its existence, while the other was taken up but once, and was in good condition when the continuously strained one and worn out.

BOILER EXPLOSIONS.

By Geo. C. Romm.

ON the 18th February last, a rag boiler in a paper mill near Stockport, England, violently exploded, completely wrecking the building which contained it. It was a plain cylindrical shell with hemispherical ends supported on trunions on which it revolved. A small steam engine beside it supplied the power for turning it, and the exhaust steam from the engine passed into a receiver, which had on it a safety valve loaded to open at 30 lbs. pressure per square inch. From the receiver the steam went to the rag boiler, which was seven feet in diameter and seventeen feet long and made of plates 7-16 inch thick. The boiler had been in use for about fourteen years and was not under the inspection of any of the Boiler Inspection Companies.

So far as known it was in fairly good order, except some corrosion at the man holes, and the pressure did not exceed the load on the safety valve, which was said to be 30 lbs. per square inch.

As many explosions have taken place of similar boilers to this one, and astonishment has been often expressed at the amount of damage done by them, and at the low pressure which produced such results, it will be of interest and value to consider the cause and the reason for such violence.

In this particular boiler two large man-holes had been made, and they were each about 3 feet long and 18 inches wide. They were used for filling and emptying the boiler, and as it was considered necessary to have both open at the same time, they were made in the same side of the boiler, and a straight line drawn from end to end passed through the centre of the man-holes. The effect of this was that while the parallel part of the boiler was about ten feet long, on the one side six feet of the ten had been cut out. In order to make up for this, light angle iron had been rivetted around each man-hole, but the angle iron was not nearly equal in section to the plate which had been cut out. Leaving out of consideration the hemispherical ends, it will be seen that while a large part of the shell had ten feet of plate to resist the pressure, there were only four feet in the line of the man-holes to resist the same amount of pressure, with a light angle iron to help. In addition to this, a certain strain was thrown on the shell by its being supported on trunions and made to revolve. As the part with the man-holes in it formed the top and again the bottom, there was probably more or less of bending occurred. When the explosion occurred the plate tore at the opposite corners of one of the man-holes, and about one half of the cylindrical shell was opened out flat, and pieces of the boiler thrown about, and a complete wreck of the buildings made.

The cause of the tearing of the plate is now plainly seen to have been due to original weakness of construction, aggravated by corrosion and by repeated slight bending as the boiler revolved. The leakage which caused the corrosion is evidence of the bending. The boiler ought not to have been made with such large openings in the shell, without having pieces rivetted around them containing at least as much strength of metal as had been cut out. Then the openings ought not to have been on the same side, but should have been on opposite sides, and also at opposite ends.

But whence came the force which did so much damage with only a pressure of 30 pounds? This boiler had no fire under it or near it, and consequently there could be no mysterious superheating of water, nor any flame to set fire to any wonderful gas which spontaneously generated in the boiler for the express purpose of blowing it up.

This boiler had no water level, and consequently did not go off because of low water. The boiler was used for rag boiling, and was probably full of water and rags, or nearly so, at the time of the explosion. The water in it would be at a temperature equal to that of steam at 30 lb. pressure, and so soon as this pressure was removed by the giving way of the plate, the water would be thrown into violent ebullition by the effort of the heat within it to escape or to form steam. The water thrown against the sides of the plate which has begun to open would act like blows from a hammer, and force the plates still further apart. The steam and hot vapour given off by the water would momentarily displace a large amount of air, and as they condensed, a partial vacuum would be formed, into which the air would again be forced with a pressure of over 2,000 pounds per square foot. We need not wonder at walls giving way and roofs tumbling in under such influences. The boiler probably contained not less than fifteen thousand pounds of water. Each pound, in cooling off to a temperature equivalent to that due to the pressure of the atmosphere, would give off energy enough to lift 400 pounds 100 feet

high, add 15,000 pounds, each trying to send its 400 pounds 100 feet into the air, would make a considerable sensation.

This case adds another proof to the oft repeated story that a first-class explosion may be had without either very high steam pressure or low water, and that highly heated water suddenly let loose into the air is about as dangerous as gun powder, or dynamite, or nitro-glycerine.

THE EDUCATION OF ENGINEERS.

By "AUTOMATIC CUT-OFF."

WHEN we see the educational advantages of Canada we, as Canadians, regard with pride our free public school system. What with our common schools, high schools, collegiate institutes and colleges, we ought to be able to prepare the young of this country for almost any position. Our colleges, many of them endowed with government help for the purpose of higher education, turn out first-class lawyers, doctors, business men and ministers, and as it is absolutely necessary for every country to have a certain number of persons in the learned professions, it is well to have these professors thoroughly well educated, and it is a great advantage to artisans and middle classes that their sons can enter these colleges and succeed, if they have the necessary brain power. While we appreciate all this, we feel that our educational system should be carried somewhat further, and a few technical schools be opened upon such a plan that all who desire to enter may do so. These schools should be equipped with the necessary tools and appliances to instruct the scholars in all kinds of practical, scientific, and technical training. The lawyers, doctors and ministers are not producers, and consequently do not bring a very great return to the country for the education so cheaply provided for them, Canada is a growing country, next door to a vigorous, energetic, grasping neighbour, and if we do not foster our industries by educating our young mechanics each in his special line, we will surely be behind in the race for first place among the nations of the world. It is the manufacturing country that makes the most rapid strides. Assisted education is what we require; and had we the facilities, we might turn out mechanical engineers of the highest class, for our young men have the stamina and brain power to do it. Of the large number of our young men who go to the United States to attend their technical schools, very few ever return to us. They nearly always pass with honours, and are engaged by the American railroad companies or large manufacturers; and if we want a first-class man, we must import one from Great Britain, the continent, or the United States.

The rapid growth of manufacturing interests has showed the live engineer that he must be up and doing. A few years ago when fuel was cheap it was not looked upon as necessary for a man to know much about steam or the steam engine in order to take charge of one; but to-day, with our fuel high and competition keen, things are very different. An engineer to succeed now, must be posted; he must keep abreast of the time. Looking back a few years, we see the old slide valve engine, with slow piston travel, labouring along at a variable speed and managing to do a little work with a consumption of fuel that was something like 7 lbs. of coal per hour for each horse power. Necessity is the mother of invention; a demand for something better soon created it, and the result is the high class automatic engine of to-day, that only uses 3 lbs. coal per horse power each hour—and by adding condensers where water is available for the purpose, the fuel is further reduced; and a tendency for compound engines is growing which will in all probability reduce the coal used to 1½ lbs. per hour per horse power.

The stationary engineers who are alive to their employers' interests, recognizing the necessity of keeping up with the improvements in steam engineering, have organized associations, the objects of which are to educate themselves and to assist each other to obtain that knowledge necessary for success. These men are spending their own time and money—sometimes engaging lecturers or having papers read on various matters pertaining to their calling; and if there was such a thing as a technical school, with evening classes, many of them would attend.

Such a movement being educational, there is not an employer who would not reap a benefit if he helped his engineer along. A word of encouragement, a mechanical book, or even a dollar or two expended in this way, would surely be a good investment. In the organization of these societies, the employer is not shut out, but is invited to join, and this of itself proclaims that these organizations are not Trades Unions in any sense of the word.

The factory that is blessed with a good engineer has

no shut downs, no hot boxes or loose screws to delay every hand about the place. He is always ready on time in the morning, his repair bills are light, and his fuel bill is carefully watched. Such a man is more than a coal heaver—he must be a thinking man, and, consequently, a progressive one. These are the kind of men that the Stationary Engineers' Associations are trying to make, and it is to every person's interest that they should succeed.

SIZE OF STEAM PIPES.

CONSIDERABLE question has been raised of late, says the *American Engineer*, as to the size of steam pipes leading to engines. The pressure in the steam chest should be at all times within at least one or two pounds of boiler pressure; for comparatively short distances, the pressure should be alike. In most cases any lack of pressure in the steam chest is at once attributed to an insufficient area in the steam pipe, while it is in fact quite often due to a reduced area of steam stop. All valves whether in the steam pipe or in the chest should have area enough to permit of a free circulation of the steam without reducing the pressure.

The main steam pipe should be of such size that the velocity of steam passage through it should be at a rate of not more than 7,500 feet per minute to keep up an ample supply. This is an average speed for all conditions. If the chest is large and there is ample time for its easy filling up again between the cut-offs of each end of cylinder, the velocity of the steam through the pipes may be somewhat reduced, but it is hardly safe to figure so close. Through the steam ports a free circulation should be permitted, especially where the ports are numerous and narrow. The friction through a number of small ports is much greater than through a single port having equal area; also where the exhaust steam passes through the same ports as the live steam, allowance should be made to provide for a free movement of exhaust, but care should be taken that such liberal allowance for free passage should not develop too excessive a clearance; hence for every increase in width a decrease in length of passage between cylinder circumference and valve face should be sought. The movement of the steam to the cylinder through the ports should not exceed a rate of 6,000 feet per minute. The quick or slow movement of the admission valve should be considered with reference to this rate of admission. In fact a quick movement only should be considered and permitted if a good engine is expected. The exhaust release should be free and of equal speed with the live steam, so that the pressure in the passage and condenser should not differ much at the moment of release, in other words, the steam should move directly (not expand) into the condenser. Of course the same conditions should maintain in the passage of steam from a high pressure cylinder to a low pressure cylinder of a compound engine, that the movement of the exhaust steam to the receiver or lower pressure cylinder as the case may be, should be such that no reduction of pressure would result. Where a receiver is used, there not being a constant supply or feed, the pressure is raised by the admission of steam from the high pressure exhaust and lowered by the discharge of steam into a low pressure cylinder.

ELECTRIC MOTORS AND THE STEAM ENGINE.

THERE are certain enthusiasts who do not hesitate to say that the motor, of the future will be the electric motor, and that the use of motive power is to be almost indefinitely extended. But, with curious inconsistency, they assert, in the same breath that the steam engine must go. Those who look a little deeper into cause and effect understand that if the wildest dreams of electric enthusiasts were instantly realized so far as to use electric motors—if it were possible—whatever power is now furnished direct by steam engines, the world would be enormously short in steam engines, and steam engine building would be, for a time, by far the greatest business of the age. The power that does the work of the world by steam would be entirely inadequate if this power had to be furnished through the connecting link of electric motors, with the attendant waste of energy.

The steam engine will stand at least until the dreams of those who hope to make electricity direct from coal assume tangible form, and even then there is great probability that it will continue to be "the great prime mover." This is not saying that electric motors will not come to be used to a considerable extent, but steam engine builders can console themselves with the fact that every one substituted for direct will give them more instead of less work.

About \$600,000 worth of machinery went up in smoke in the United States and Canada during the month of February.

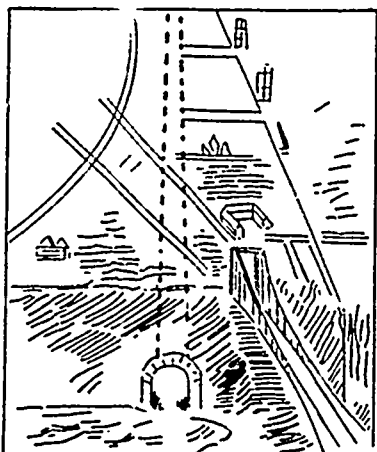
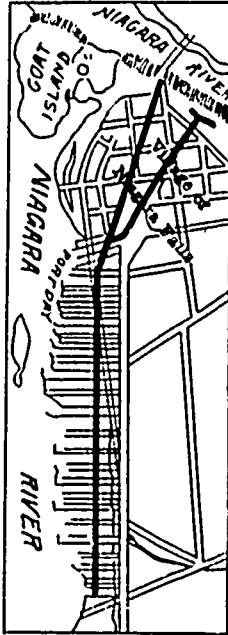
NIAGARA RIVER POWER.

ALL lovers of the sublime and beautiful in nature have rejoiced that the State of New York at last took control of Niagara Falls, laid out a reservation including and preserving the adjacent beauty, and to some extent regulating the cost of a visit to the great waterfall. At the same time, all who have seriously thought of the immense water-power there literally "running to waste" have had their utilitarian instincts grieved by the confident statement that there was no way to utilize the force without marring the beauty. How to make Niagara useful without making it less beautiful has been the question; and it is now confidently announced that the problem is solved.

Niagara, say the engineers, can be made to yield 119,000 horse power and not a foot of the reservation be encroached upon any building erected near the falls. Mr. Thomas Evershed, Division Engineer of the New York State Canals, has presented the perfect plan and estimates; Mr. Elnathan Sweet, New York State Engineer and Surveyor, has cordially approved them, and a company has been formed to carry them into execution. This company proposes to furnish 500 horse power each to 238 mills, which shall be located from one mile to two and a half miles up the river from the falls, in no way interfering with the view, yet easily accessible by the river and railroad, and all this they propose to accomplish by one great tunnel underneath the town and side tunnels from the river, each with its wheel pit for turbine water-wheels—the whole series drawing through the main tunnel to the level of the river below the falls. Thus they will secure, at a cost of \$3,000,000 or less, a power exceeding the combined water power of Holyoke, Lowell, Minneapolis, Cohoes, Lewiston, and Lawrence, and unlike theirs, subject to no vicissitudes of drouth or danger of overflow or destruction of dams, but from sources exhaustless as the great lakes and in tunnels as enduring as the solid rock.

The conception is sublime. The complete work would seem to undo any of the wonders of the ancient world. It exalts one's views of the dignity of the human intellect. Yet the plan is so simple that the most ignorant can comprehend it.

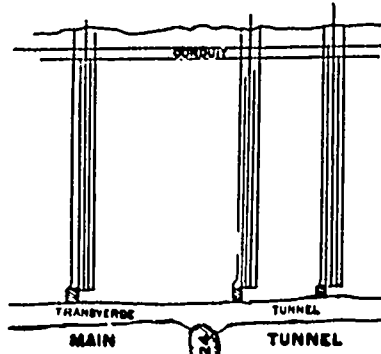
The conditions are these: From the head of the rapids to the cataracts the fall is sixty-five feet, height of cataract 165 feet, total fall 230 feet. The average flow of the river is 275,000 cubic feet per second; total water power, therefore, 7,000,000 horse power, from which the company proposes to take only 190,000 horse power. At the foot of the falls the river turns almost square to the right; thus a straight line from the rapids to the edge of the water just below them is the hypotenuse of



a right-angled triangle. The tunnel, therefore, is to begin at a point just above high water level, but 200 feet below the top of the bluff, below the falls; thence it is to run at an up-grade of one foot in 100 through the solid rock to a point a mile above the falls; thence it is to continue one and a half miles parallel with the river, 400 feet distant from it and 100 feet below it, and to be connected with it by lateral tunnels. Of these each is to have its wheel-pit for a water-wheel, and the slope of the lateral tunneling is to be such as to secure a rapid discharge of the water. The main tunnel is to be twenty-four feet in diameter, amply sufficient to discharge all water that the lateral tunnels may pour into it; and these with heads ranging from twenty-four to eighty

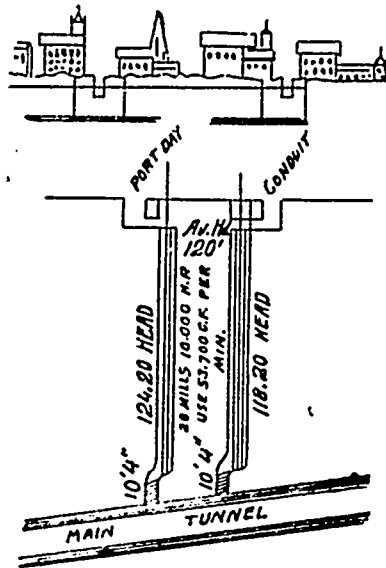
feet, for turbine wheels of the latest pattern, will amply secure the promised 119,000 horse power, or, 500 horse power each for the 238 factories, for which sites can be provided in the space secured.

It is proposed to lay out the mill sites of sizes from 75x200 to 200x400 feet; to leave ample space between



for railroad tracks to the main line and for streets; to build wharves and secure landings for lake and canal vessels, and secure ample rail connections with the railroads centering at the falls. And finally the company propose a charge of but \$10 per year for each horse power of water supplied—less than a third of the average cost at other places—yet when all the sites are utilized the income will be 40 per cent. on the total cost. These are the immediate returns looked for; but beyond lie vast possibilities of storing and transporting the power by electricity to neighboring cities.

Considering the fact that the available water power of the country is diminishing as the forests are cleared, and that in many manufacturing centers summer drouth and winter floods are serious menaces, one can but wonder that the exhaustless power of Niagara has not already been utilized. Manufacturers would hardly ask us to credit them with sentimental reasons for withholding their hands. No doubt the principle obstacle has been the enormous initial cost of making the improvements, as it presented itself to most who examined the subject. No one company could profitably utilize such a power; and it was not easy to form a sufficient combination of companies. The fact that Niagara is on the Canada frontier had something to do with it no doubt; and still more, that it was on the western frontier when the factories of New England and Eastern New York were established. Some small raceways were made several years ago, involving not 1,000 horse power in all; but they all come within the fixed bounds of the park reserved by the state, and are, of course, discontinued. In



1855 the hydraulic canal was begun, outside the limits of the reservation—that is, across the peninsula on which the village of Niagara Falls is built, and after a long disuse it was reopened in 1878, and now supplies power to a few manufacturers. Since July 4, 1879, a Brush dynamo, supplied with power by the rapids, has been run in Prospect Park for the illumination of the falls and grounds, and other small uses have been made of the power. But all appear trifling compared with the plan proposed by the new company.

Another scheme for the utilization of Niagara's power has been set on foot by certain gentlemen of Lockport, N. Y. Their purpose is to supply water for the city of Tonawanda and vicinity, for manufacturing and other purposes, by taking it from the Niagara river at Tonawanda, or some point between Tonawanda and Niagara Falls, and discharging the current into Lake Ontario near the village of Olcott. The watchwords of this organization are taking. They are: Lake Erie, the mill-pond. Niagara river, the head-race. Lake Ontario the tail-race. No floods. No drouths. No broken dams. No idle mills.

The land at Tonawanda is but little higher than the river. From there northward is a gradual rise for about ten miles to a ridge running in an east and west direction, Lockport being situated on the ridge, whose crest there is lower than farther west, and is cut by two ravines or depressions. The work will be all cutting, and little or no embankment will be required. From Lockport to the mouth of Eighteen Mile Creek the country falls and the distance is comparatively trifling.

The Niagara river has a fall of 333 feet. It is proposed to run a canal from a point opposite Grand Island, near Tonawanda, where the current is not rapid, to Lockport, discharging the water which shall pass through it into Eighteen Mile Creek, which empties into Lake Ontario and will form a conduit for about one-third of the distance. The utilization of the power is first practicable at Lockport. Between Lockport and the lake twenty dams are practicable, at each of which the full power of the water of the canal with a considerable head can be effective. Of course the size of the canal and the fall obtained will determine the amount of power that can be made available. It is claimed that 363,636 horse power can be obtained at Lockport, where a 220 feet fall can be had if the canal be twenty feet deep and 200 feet wide.—Chicago Tribune.

FIRE PRECAUTIONS FOR WOOD-WORKING SHOPS.

THE police authorities of Berlin, Prussia, have published the following orders regulating the arrangements where fires are used in wood-working shops in that city:

1. The wood shops must have solid principal walls of brick or stone.
2. When there are persons dwelling over wood-working shops, the floors of such dwellings must be fireproof (*feuerfest*), and any wooden floors must have ceiling below piped and plastered, and the plaster covered with corrugated sheet iron.
3. In arrangements for heating wood-working shops during winter, or for drying purposes, no kind of metallic stoves or pipes for the same, shall be used. Stoves must be stone or tile, and so arranged that they can be supplied with fuel on the outside only of the workrooms, or in a fireproof projection at least 59 inches in height and 20 inches in depth. Any iron cover which may be upon such stoves must be protected with at least two thicknesses of tiles or slates laid in mortar. For conducting smoke from stoves to chimneys, only flues built in walls shall be used. Wood-working shops having in one or in several rooms a superficial area of 9,700 feet must conform to the following prescribings:

(a.) Among dwellings, wood-working shops and the needful storage room therefor shall be permitted only when they are entirely isolated from the dwellings that may be located above them by fireproof floors (as above stated), and when the buildings have one or more staircases, separated from the workshop by substantial walls.

(b.) The stairways to such workshops must be fire-proof, and doors leading therefrom to interior made of iron. Doors must open outward, and be self-closing. Such doors are not to have wooden cases, or other wooden supports.

(c.) For each workshop there must be a separate glue-heating-room, having thick brick walls, ceiling vaulted, and floor and ceiling below of non-inflammable materials. There must be an iron door at the entrance of this room, and between the door, when open, and the heating furnace a distance of at least 20 inches. So-called "glue-heaters" are not permitted.

(d.) Every workshop must have a separate shavings bin, located in the cellar, or upon solid ground outside—constructed on the four sides of thick walls, vaulted above. This bin must have a separate entrance from the court-yard, closed by iron or an iron-plated door.

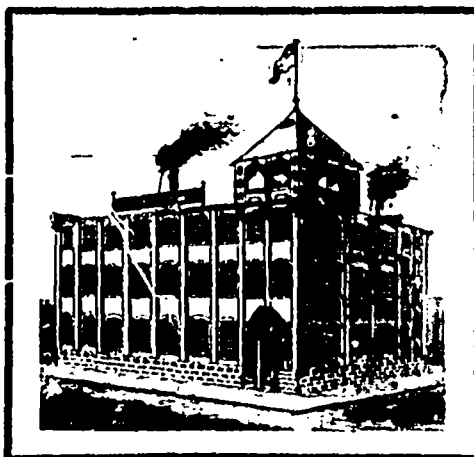
A new system of flour dressing has been patented in England, for which many notable advantages are claimed—among others, the practical suppression of reels, and the enlargement of the flour yield by 10 to 20 per cent. It is the invention of Mr. Carl Haggemacher, of Budapest, and is being put on the market under the title of the "Plansichter Patent Carl Haggemacher."

When a buhr gives out a growling, booming sound, says a writer in the *Milling World*, it needs prompt attention. One of two things has happened, either the stone is out of balance or it is out of face. If it is out of balance and grinding against the other, the friction will account for the growling sound and the stone will "smell." If the balance be all right and the stone be out of face, the unusual noise will be heard, but no smell will be given off. In either case the remedy is simple. In the first place restore the balance. In the second case pick down the inside blocks below rek-staff contact and widen the furrows. These noises are common in the case of badly handled corn buhrs.

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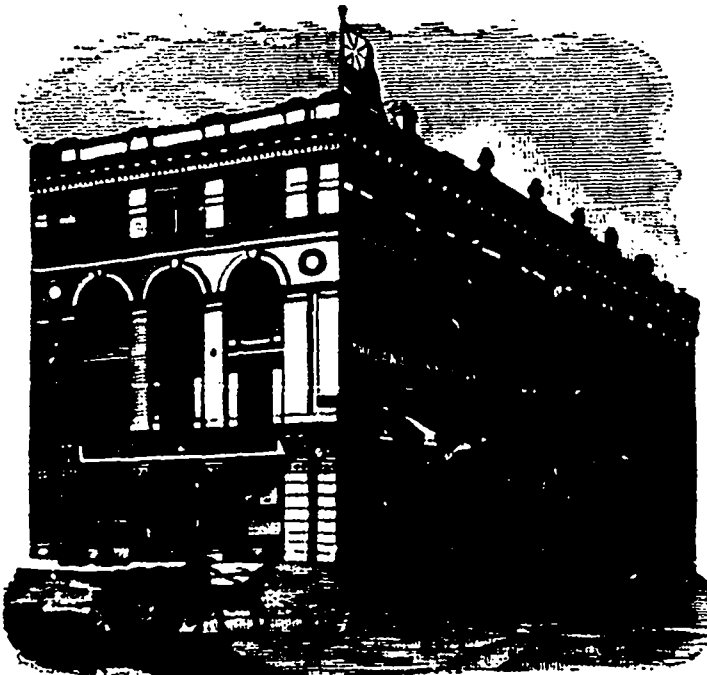
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PROCTOR'S POINTS.

THE writer happened, the other day, to be present and overheard a conversation between two business men, one of whom was trying to sell to the other a number of shares of the capital stock of an electric light company which is supplying light to one of our thriving Ontario towns. Mr. B, however, declined to buy, at the same time remarking that he never put money into any kind of stocks but *bank stocks*. His emphasis on the phrase "bank stocks," put me a-thinking why was this thus, and why manufacturing or gas or electric light stocks were not as good an investment as bank stocks, or as certain to yield a profit, or maintain the value of an original investment.

The four letters - B, A, N, K—when put into the form of a word, and that word becomes an adjective qualifying the word 'stock,' seem to have a wonderful fascination for some people. Their usual commercial prudence, their faculty of investigation, their ordinary care to have first-class security, all seem to forsake them in the presence of that little adjective, and to be utterly ashamed to insinuate the slightest necessity for their existence in connection with any transaction where bank stocks are one of the factors. Let us have a look at the comparative value of bank stock and any of the stocks mentioned above, from another standpoint, and see what substantial reason there is for this morbid preference for the former over the latter.

Manufacturing stocks, *i. e.*, stock of manufacturing concerns, will certainly compare favorably with bank stocks in the matter of security for the investment and earning power. In the matter of security for the original investment for plant, etc., there are very few manufacturing stock companies that, if closed down and wound up, would not realize as great a percentage of the original capital for the shareholders as the great majority of our banks would. There is very little doubt that quite a respectable number of men—even in this comparatively new country of ours—would pay better, in liquidation, than even our best banks. In the matter of dividend earning power, facts have demonstrated over and over again that any reasonably well managed concern can pay as good dividends as any similarly well managed bank, while, if the investing public would yield the manufacturing concerns the same justice in the purchase and manipulation of their stocks as they do the banks, by the obtaining of cheaper money, much larger dividends could be paid.

It appears very certain to most people that—with money for a basis of investment instead of real estate, bricks and mortar, machinery, or other plant of this description—there must therefore be better security and more certain commercial success in dealing in bank stock than in any other class of stocks. These people must surely forget that neither the original capital nor the borrowed capital of any bank remains permanently in that bank, but is represented in the assets of the bank by "commercial paper." An impartial investigation of this in most banks would reveal a very considerable amount of paper under discount that no careful intelligent stockholder of that bank would care to put his money into; and would still further reveal "demand notes" and other apparently tangible securities, carried forward as "cash," that are utterly worthless. Apparent profits, out of which dividends are paid, are not always real profits, and it has occurred over and over again that dividends and bonuses have been paid by some of our Canadian banks from year to year very largely out of original capital. The revelations in the Central Bank have shown that not only do the stockholders have tangible and valuable assets to represent their stock, but that they will have to put up a further amount equal to the full value of their stock to get rid of the responsibility of having owned it. No manufacturing concern ever placed its stockholders in so embarrassing a position.

Gas stocks have always paid handsome dividends. Not only interest on the capital invested, but, where that capital provided, to begin with, a plant at all commensurate with the requirements of the location, provided a substantial sinking fund for adding to and replacing the original plant, the instance of loss to holders of gas stocks have been so few and infrequent that even that oracle of mundane matters, "the oldest inhabitant," can number them all on the fingers of one hand, and have a pair of spoon holders left.

In electrical matters a still more decided advantage

in the way of permanent, substantial security and profitable investment exists. A substantial, well arranged, and properly constructed plant in a good location will have a life of twenty to forty years, and will, like a gas plant, pay from the moment the power is turned on to the dynamo, not only good interest on the investment, but provide fully for repairs and increase of plant. About \$250,000 is invested in electric light plants on this Continent, and only a few minor failures through gross mismanagement and ignorance have occurred, and if any plant is not paying good profits the blame is entirely attributable to the owners having put in some of the "Snide," "Jim-Crow," cheap (?) systems that are catering for patronage. No better paying or more secure investment is offered in Canada to-day than electric light stock with a good system.

"Proctor" is not a crank nor and an alarmist. He has no quarrel with the banks. He has, however, a profound contempt for fossilized, antiquated ignorance. Practical observation and experience has demonstrated to him the truth of the statements made herein, and he can show any intelligent doubter an array of figures and facts that will convince the most skeptical.

PROCTOR.

PRIME ELEMENTS OF SUCCESS.

MIGHT I ask if you have ever considered, yes meditated and reconsidered, says a writer in the *Wood Worker*, some of the things happening in and around "Successful's" workshop, where in every move, yes, the very air which one breathes, seems to be filled with success: where the buzz of the saws; the peculiarly shrill song of the planers; the silent yet steadily moving engine; the peculiar whirr of the belts and rotating parts as they glide along on their various missions; the thump of that mortise chisel intermingled with the song or whistle of the operator as he keeps time therewith, each of which seems to add a peculiarly yet noticeable stamp to the success of the place? Added thereto the peculiar looks, ways, names, systems and methods of the generally happy, clean, busy, contented and well-paid workmen of this shop, who seem to remind me of an accurately-cut and well-regulated train of gearing, of which each has its specific duty to perform, and in order to well and profitably perform it is geared to a steady and lively speed, and yet the whole mechanism so arranged that each may do his part with particular ease? If you have never given this but a passing glance, as well as the causes which lead to success in Successful's shop, you may perchance find a few notes of interest for you and your readers in this letter of mine.

Successful has been the proprietor of a shop for many years. His name is one which has been long and favorably known at home, with a well defined tinge of reputation abroad. He is a credit to the town which has the honor to claim him for a citizen: so much so, that I have made it an object to cultivate his acquaintance, observe him and his ways closely, and also the workings of his shop, in the hopes of eventually inculcating into myself and shop some of his business sagacity and principles, and above all that peculiar "tact" which he controls, and which through him as a *prime mover* seems to be imparted to every other member of his establishment, and which so distinctly forms this noticeable feature which singularly marks his establishment from that of his unsuccessful rivals.

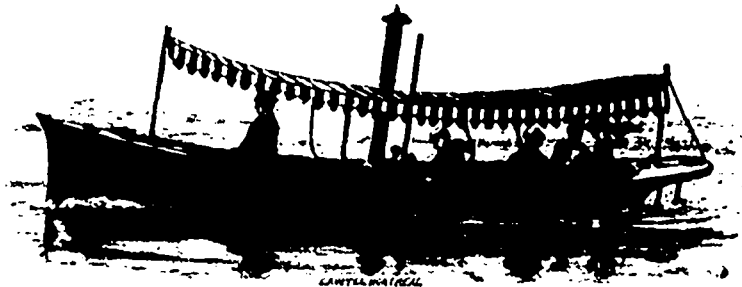
In his office and shop we can observe a remarkably well-regulated and praiseworthy system in everything, be it ever so small. I observe that every foreman has his specific place, knows his whole duty and performs it; likewise every workman knows precisely what to do, and does it; each subordinate foreman has explicit orders never to put any workman upon a job without each man knowing just what part he has to perform and the exact manner in which he is to perform it, together with the quality of work which is expected when the job is completed. There is not a move, no, not a single one, made in his shop without an exact, precise and explicit order, emanating from a superior officer, who in turn is directly and personally responsible to Successful himself, for the quality and quantity of work produced by each and every subordinate workman of his department.

Successful himself is a clear-headed, active, and prompt man, full of precision, with a quick eye and open ear. He keeps himself posted in the markets of the day, knows when to buy his crude stock, and when and how to sell his finished product in the most profitable manner; when to manufacture goods ahead, and what kind of goods to make, and when not to manufacture or carry a stock of manufactured goods. He is a wide-awake and never-go-to-sleep man, ever ready to spread

his sails and take advantage of every wind that blows; he is the observed of all observers, yet he himself, with his open eye and ear, seems to see, hear and know all that transpires around him. He knows how the work must be performed, and therefore directs every move of importance which is made in his shop; he receives a report from each of his subordinate officers from time to time, and makes it his special duty to see that they know their duty in every minute detail of their several departments, and perform it with precision and despatch. There is no such thing as an idle wheel known among his force of employes; useful as is this sort of a wheel in some mechanical constructions, and for the operating of some machinery, Successful has never yet found an open place for such a person amongst the mechanism of his working force of employes. He recognizes and prefers his employes according to their several and special abilities, and pays them in accordance therewith, without regard to highly-colored and superfluous recommendations, or personal family connections, whatever. Because Tom happens to be a kin of his has no weight; the question of work resolves itself simply upon what he can best perform, and the pay upon what he is actually worth to the business. Promptness and steadiness in steadiness in all things is a noticeable feature of his life, and one which he demands from every workman in his employ. Personally he can be found at his place of business at seven o'clock in the morning, and remains at his post of duty as long as any of his men, and while he is there, he makes use of that faculty which I may call *tact*, and which I define as not any one of the five senses in particular, but the employment of all five senses in general.

The machinery in Successful's shop is of an approved and late pattern; no shoddy, no half-way kind; but it must be of that type which will produce the most work with the least expenditure of power and skilled labor, and other expense. He does not buy machines because they happen to be of a certain make; he knows full well that one maker may make a perfect saw table, while his mortise machines or planers may not be as handily or perfectly constructed, nor as economizing in their operation, as some of another make. Every builder of wood-working machinery has some pets among the machines which he builds, and very naturally may build one class of machines better than his competitors, while in another class or kind of machines he may be far behind the times. He knows this full well, therefore one may find machines of almost every prominent maker who makes machines which are used in his line of manufacture. He never buys or keeps a machine which can not satisfactorily demonstrate a saving of some kind over methods previously employed by him, or which can not be operated with a fair percentage of profit to himself and business.

He never waits until his neighboring competitors put in improved and labor-saving machinery or other contrivances, and thus force him to put in the same kind or others in order to keep abreast with the times of the day. Oh, no! but, to the very contrary, when a new machine comes to the front and its makers claim any advantages for it over others employed by him, he immediately begins to investigate and inquire, and learn more about it, and when the makers thereof can satisfy him as to quality and quantity of work it will produce, he begins to calculate the extra expense, if any, attached to the operating of it, and the maintaining of the same, such as the interest on the additional investment, insurance, wear and tear, and all other incidentals therewith connected. If all things, after due investigation and meditation, seem to warrant it, the machine or machines are put in forthwith, without any delay; by making a few simple calculations beforehand, he seldom fails to put in machinery which is desirable or profitable, and thus saves himself as well as the maker of machinery from whom the purchase is made, much annoyance and trouble. And, while I am speaking of machinery, let me add that Successful does not year after year invoice his machines at their original cost price. No, no! he is aware of the fact that wood-working machinery is short-lived, and at the furthest, if run steadily, will not probably live beyond a period of from ten to fifteen years; and if perchance by proper usage it does outlive that period of time, that the progress and improvements made in this kind of machinery by the builders thereof, will, at that time, have produced machines far superior to his, so much so that it will pay him to set the old ones aside and put in machines of the later improved kind; at least this seems to have been the history of this branch of business for the last four-score years; hence, when the yearly invoice is taken, a proper allowance is taken off their original cost price every year, basing this allowance on the working life of his machines at fifteen years.



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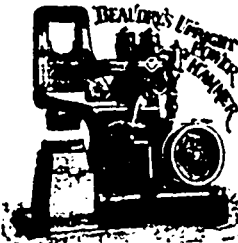
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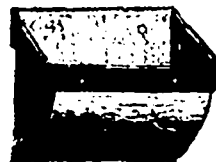
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TORONTO.



A new machine shop is being started at Waterville, Que. by Mr. T. H. Sleeper.

A local company will bore for natural gas at Welland, Ont., also at Whitby, Ont.

R. Rabjohn, Fournery, Thompsonville, Ont., recently called a meeting of creditors.

A company has been organized at Smith's Falls for the manufacture of patent fire escapes.

The British Government will establish a large arsenal upon 200 acres of land near Esquimaux.

A manufactory of boilers will be established by Messrs. Major & Beth, at Vancouver, British Columbia.

Cowan's machine shop, Stratford, was recently entered by thieves and a quantity of tools stolen.

Mr. Broad, of Buffalo, N. Y. will commence the manufacture of edge tools at Port Colborne Ont., shortly.

Mr. James Shepherd had one of his hands badly mangled by a saw he was attending in the Clinton Foundry and Machine Shop.

The completion of the new C. P. R. workshops at Vancouver, British Columbia, is being hurried forward. The shops will give employment to about 300 men.

A company has been formed in Berlin to manufacture electrical watches. Two small cells and a small electrical motor take the place of an ordinary movement.

The ratepayers of St. Mary's are considering a proposal to bonus the Maxwell Manufacturing Company to the extent of \$30,000 and ten years tax exemption to remove their works from Paris to that town.

Nearly 19,000 feet of space has been applied for by Canadian exhibitors at the Melbourne, Australia, international exhibition of 1888. The exhibition opens on August 1st and closes January 31st, 1889.

It may interest certain Canadian manufacturers to know that the system of rope transmission which is being introduced to machinery users as something entirely new, was in practical operation in Scotland as long ago as the year 1844.

The McClary Manufacturing Co., of London, and Mr. Thomas Wilson, of Dundas, are said to have purchased the controlling interest in the Burn, Robinson Manufacturing Co., of Hamilton, and will decide on a location for carrying on the business.

The Orillia, Ont., Town Council has granted to the Longford Lumber Co. exemption from taxation for a period of ten years on the land and building they purpose erecting for the manufacture of woodenware. The building and plant is estimated to cost about \$40,000.

Ten thousand tons of tubing will be required for the St. Clair tunnel between Sarnia and Port Huron, and the new Grand Trunk shops at Stratford are being pushed forward as fast as possible so that they may be in a position to manufacture this tubing by August next.

The screw auger was invented by Thomas Garrett about 100 years ago. He lived near Oxford, Chester county, Pa. The single screw auger was invented by a Philadelphian, and is said to be the only one used with any satisfaction in very hard woods where the double screwed augers become clogged.

The C. P. R. refuse, it is said, to locate their workshops at Fort William unless they are granted exemption from taxation. The authorities of that place are getting signatures to a petition with that object, but they have not explained how they propose to override or evade the Ontario statute which prohibits them from granting such privileges.

The fifteen great American inventions of world-wide adoption in the opinion of the *Progressive Age* are (1) the cotton gin, (2) the planing machine, (3) the grass mower and reaper, (4) the rotary printing press, (5) navigation by steam, (6) the hot air engine, (7) the sewing machine, (8) the Indian rubber industry, (9) the machine manufacture for horseshoes, (10) the sand blast for carving, (11) the gauge lathe, (12) the grain elevator, (13) artificial ice making on a large scale, (14) the electric magnet and its practical application, (15) the telephone.

An ingenious device for stretching emery cloth for use in the workshop consists of a couple of strips of wood about fourteen inches long, hinged longitudinally, and of round, half-round, triangular or any other shape in cross section. On the inside faces of the wood strips are pointed studs, taking into holes on the opposite sides. The strip of emery cloth is laid on to one set in the studs, and the "side," as it is called, closed, which fixes the strips on one side. It is then similarly fixed on the other side, and thus constitutes what is called an "emery file," and which is a handy and convenient arrangement for workshop use.

Every young mechanic in an iron-working establishment should learn to do the scientific part of his work as well as the practical part. In addition to being able to make machines from the drawings of other men, he should make an effort to learn to make the drawings as well. Of course every young man has or should have an ambition to reach the top of the ladder in his profession, and the young mechanic who fits himself for the highest positions shall reap the benefits of his efforts at self-improvement. Any young man of average intelligence can master the scientific side of his work by self-teaching, with occasional assistance over rough spots, and the one who fails to do this dooms himself to the poorer-paid work all his life.

The *Cowanville Observer* says: "Mr. J. E. Beauchemin, of Sorel, Que., has patented in Canada and the United States, a very peculiar and compact steam engine. It is four cylinder, and the cylinders are at the end of four arms. The steam enters through a shaft, and the whole engine is housed in, and looks like a fan

blower. He claims for it great power and a saving of from 50 to 70 per cent. in fuel for the power given. For an engine occupying a space of 35x13 inches he claims fifty horse power. He says there is friction in no place about it but at the main shaft. It is noiseless and runs so still and smooth that a small one running all the machinery in his shop, weighing only 500 lbs., does not require to be bolted down. Many mechanical and scientific men have examined it and all speak in high terms of it."



A grain elevator is wanted at Killarney, Man.

Ogilvie's large Winnipeg mill is again running

J. B. Proteau, miller, St. Thomas, Que., has assigned.

The new roller mill at Rapid City, Man., is in operation.

McKenzie Bros' grist mill, Kirkfield, Ont., is now in full blast.

The foundation has been laid for the new flour mill at Oak Lake, Man.

Mr. Edward M. Tennyson has removed from Walkerton Ont., to Brandon, Man.

The Mount Forest steam roller mill, which ceased operations temporarily, is again running

Balcolm's mills at Vienna, Ont., had a very narrow escape from destruction by fire on March 27th.

Messrs. Steven Farquhar, Winnipeg, have the contract for Leitch Bros' new mill at Oak Lake, Man.

The Winnipeg Board of Trade is still agitating for the lowering of the grain standards for Manitoba wheat.

Leitch Bros., of Oak Lake, have rented the Assiniboia roller mills at Moosomin, Man., for four months.

Another large grain elevator is talked of for Fort William in addition to the one which the C. P. R. is building.

It is expected that Messrs. Leitch Bros' new mill at Oak Lake, Man., will turn out from 200 to 250 barrels per day.

The farmers of Belmont failed to raise the necessary amount for the erection of another elevator at Morden, Man.

The Reeve of Gowansstown Township, Ont., will give give a of \$2,000 to any one who will build a flour and oatmeal mill.

Mr. Morton, of Boissevain, N. W. T., will build an elevator at Deloraine in the spring if good water powers can be obtained.

A company with a capital stock of \$30,000 is seeking incorporation with the object of erecting a roller flour mill at Neepawa.

Messrs. J. and H. Miller, Mount Elgin, Ont., have sawed and delivered since the 1st of January over 200,000 feet of lumber.

The Yorkton, Assiniboia, roller mill, which was closed down to allow of repairs being made to the boiler, is in operation again.

Morton's grist and saw mills, at St. Ola, Ont., were destroyed recently by fire. Loss \$5,000. No insurance. They will be rebuilt.

Mr. S. Radham, Pakenham, Ont., is about to convert Messrs. Gilles Bros' grist mill at that place into a roller process flouring mill.

Donnison City, Man., is considering the proposal to grant a bonus of \$2,500 for the erection of a small roller mill at that place.

The Canadian Pacific Railway Co. is said to have in contemplation the erection of two large grain elevators on the Kamistiquia river.

Buckle & Mays roller flour mill at Petrolia, Ont., was completely destroyed by fire last Wednesday morning. Loss about \$10,000, no insurance.

A Vancouver correspondent states that there is talk of establishing a flour mill on the inlet, from which vessels could load flour for China and Japan.

Messrs. M. McFarlane, E. W. Farwell and H. E. McFarlane have purchased the grist mill at Sherbrooke, Que., and will add roller process machinery.

A large and influential deputation of business men recently waited on the Minister of Railways with regard to the enlarging of the St. Lawrence canal.

Mr. Robt. Whiteland, of Woodstock, Ont., who is to put in the machinery for the new mill at North Norfolk, Man., expects to have it running by June 15th.

The cylinder end blew out of the Manitoba Milling Co.'s engine at Carberry, Man., recently, and in consequence the mill had to cease operations for ten days.

The Council of Shoal Lake, Man., have granted \$500 toward the erection of a 30,000 bushel elevator to be built next summer by Tim-well & Sons' English syndicate.

Mr. T. R. Jackson, Louisville, Ont., is preparing to build a large elevator this season. There are also prospects of a new custom flour mill going up at the station.

On the morning of March 11th the elevators and several thousand bushels of grain belonging to Messrs. Endicott Bros., at Charleston, Ont., were totally destroyed by fire.

As soon as the Northwest Central Railway is completed to Oak River Messrs. Head & Christie, grain buyers, of Rapid City, Man., will build a 40,000 bushel elevator there.

David Fraser, of Denton, Texas, offers to put \$1,000 into the proposed new flour mill enterprise at Neepawa, Man., on condition that the management engage him as miller.

A private company is being formed at Winnipeg for the utilization of the water-power of the Assiniboine. The city has been making surveys in this direction, and will seek special legislation to prevent the private company from enjoying the benefits of its expenditure.

The annual convention of the Millers' National Association of the United States, will be held in Buffalo, N. Y., on Tuesday, Wednesday and Thursday, June 12th, 13th and 14th.

A stock company is to be formed at Douglas, N. W. T., to erect a farmers' elevator of 35,000 bushels capacity. A flour mill will also be built this summer with a capacity of 150 bushels per day.

The Cunningham Mill Moose Mountain, N.W.T., will be closed during the month of April for a thorough inspection of the machinery. The mill has been running successfully for the last six months.

Mr. Sandy McVean's new flour mill, Dresden, Ont., is almost completed. It will be one of the finest in Ontario. The Smith Purifier Company, of Stratford, has supplied all the milling machinery.

The Comber, Ont., roller mill is closed, Goldie & McCullough, of Galt, Ont., having a mortgage on the building, machinery and site for \$6,000. The village bonded this mill by private subscriptions, and now it is offered for sale.

An attempt to burn the storehouse of Holsen Bros. flour mill, at Waterdown, Ont., was made last week, but was discovered and extinguished before much damage was done. They were 3,000 bushels of grain in the building and a quantity of flour.

The following method of excluding rats and mice from gran bins, as given by a writer in the *Prairie Farmer*, will prove interesting also to owners of Canadian mills and grain warehouses, who suffer to so great an extent from the depredations of these vermin.

Fifty per cent. of the proposed capital stock of \$16,000 for the erection of a new roller mill at Macleod, Alberta, has been subscribed. The company which will at once proceed with the undertaking will be known as the Southern Alberta Milling Company.

During the past two months Robson Bros. storehouse, Waterdown, Ont., have been set on fire twice. A third attempt was made, which resulted in the total destruction of the building, together with 3000 or 4000 bushels of wheat. Loss about \$5,000, covered by insurance.

After I had been unable to exclude rats from my corn crib by ordinary means, I lined it with hemlock plank, six inches wide, and covered the floor and ceiling with the same material, placing the plank about one-fourth of an inch apart. Not a rat has found its way into the crib since. Mice, however, have found entrance, they seem to be able to gnaw hemlock, while rats cannot. To exclude these I lay the floor with plank from four to six inches wide, with inch spaces between them to admit ventilation for the corn, and then cover the whole with woven wire with meshes to exclude mice. Then nail woven wire on the cross pieces overhead. The crib will shut out both rats and mice, and let in more air than any other. Its extra cost will be repaid in a few years in clean, sound, well-dried and unmillable corn.

The London (Eng.) *Miller*. A report has lately come to hand which states that the American and Canadian oatmeal millers have followed the tendency of the age, by forming themselves into a "trust," practically a syndicate, to regulate the prices of American and Canadian oatmeal, which, by the way, is largely on the Scotch system and in many cases by Scotchmen. They have advanced their price by a dollar per barrel, and all meal shipped to this country is to be sold through one house in Liverpool at a uniform price. How this will operate remains to be seen; but in the meantime it cannot materially affect the price of meal in Scotland, owing to the exceedingly low price of oats and oatmeal. Good qualities of Russian oats sell at 11s., and Scotch at 12s. to 13s. per 24 lbs., and Scotch oatmeal has touched as low a figure as 22s. 6d. per 280 lbs., so that American and Canadian oatmeal is not likely to gain ground in this market while the home article is so very cheap.

The *Emerson Times* says: "The agitation which has been in progress since November last, over the difficulties presented by the department of customs, to the shipment of grain over the Northern Pacific Ry. to Ontario in bond has resulted in the opening of that route. A communication was received on Saturday last by Mr. Curnham, from the railway officials, enclosing a telegram from Ottawa to the Grand Trunk railway, advising that no certificates need be issued by the collector here to facilitate re-entry of the grain into Canada, but that it need merely be entered and American officers satisfied that the grain is of Canadian growth, when they will bond it to its destination. The Customs department assert that there is no desire to prevent free flow of the traffic by American channels. It is the intention very soon to send a trial car to the boundary line, which will be loaded and pushed east as rapidly as possible, after which an ample supply of cars for the trade will be provided.

One of the biggest schemes in a lumbering way that has ever been even talked of in the extreme Northwest is about being put into practical operation. The scheme contemplates the purchase of a large tract of timber land from the Northern Pacific railroad company, located in the southeastern end of Pierce county in the vicinity of what is known as the Succotash valley. A railroad will be built from a point on the main line of the Northern Pacific railroad, near the town of Orting, and run southward to what is one of the finest timber belts in the territory. Near the southern line of the county the road turns westward in two branches down the Succotash valley. The road will be built by the corporation, now about formed, but will be operated by the Northern Pacific company whose property it will become, the lumber company receiving its pay in freights and traffic. The company will build two large mills, one at Orting and the other on the water front at Tacoma. The mill at Orting is designed for eastern trade. The mill on the water front will enter the coastwise and the foreign trade. It will be one of the largest mill on the Sound or in the West. The whole enterprise comprehends an investment of \$4,000,000. Messrs. Hewitt, Glover, and Johnson, Wisconsin; Mr. Jones, of Michigan, and Col. Gregg of Minnesota, all experienced lumbermen, are the principal figures in the undertaking. The details of the contract, purchase and incorporation are now being arranged. Work will be commenced on the road and the building of the big mill at Tacoma at once. — *Winnipeg Free Press*.

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TIMEWELL & SON,

Designs, Plans and Specifications prepared for all class of buildings. Tenders obtained, and buildings constructed in any part of the province. Having had a large experience in the construction of Grain Elevators and Mills, we are in a position to supply working plans, etc. for these buildings, and the necessary machinery for any capacity on the shortest notice. Correspondence solicited. No charge for preliminary designs.
ARTHUR T. TIMEWELL, M.C.S.C.E.,
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THE BOILER INSPECTION & INSURANCE CO. OF CANADA.

CONSULTING ENGINEERS AND SOLICITORS OF PATENTS
Steam users would secure economy of fuel and safety from accidents by insuring their boilers in the above Company.

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GALT FILE WORKS
(ESTABLISHED 1870.)

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

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OBJECTS.
To prevent by all possible means the occurrence of avoidable fires.
To obviate heavy losses from the fires that are unavoidable by the nature of the work done in mills and factories.
To reduce the cost of the insurance to the lowest point consistent with the safe conduct of the business.

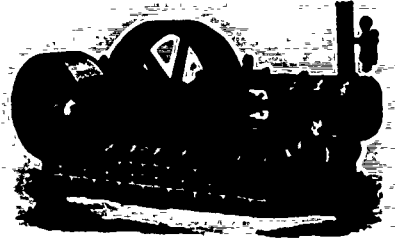
est point consistent with the safe conduct of the business.

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

MACHINERY

FOR SALE.

To Millers, Manufacturers, and all Steam Users--Write



BECKETT ENGINE CO., HAMILTON, for automatic engines.

BECKETT ENGINE CO., HAMILTON, for marine and stationary boilers.

BECKETT ENGINE CO., HAMILTON, for portable engines and boilers.

BECKETT ENGINE CO., HAMILTON, for saw mill machinery.

BECKETT ENGINE CO., HAMILTON, for saw mill engines.

BECKETT ENGINE CO., HAMILTON, for shafting and pulleys.

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BECKETT ENGINE CO., HAMILTON, for repaired engines.

BECKETT ENGINE CO. test all their boilers to three times the working pressure, before leaving the works.

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

ECONOMY--TO STEAM USERS-- great saving in fuel; a steady and uniform steam supply and a positive increase of steam capacity are effected by using the U. S. Rocking Grate Bar Co.'s grates, manufactured under patent by Beckett Engine Co., Hamilton, Ont.; from twenty to twenty-five per cent. saving according to testimonials; in use in over one hundred and forty thousand horse-power of steam boilers; two boilers with these grates do the work of three with the fixed grates. Full particulars from BECKETT ENGINE CO., Hamilton.

JOSEPH HALL MACHINE WORKS, Oshawa.

Circular Saw Tables; Wood Turning Lathes; Morticing Lathes; Car Morticing Machine; Wood Benches; Wood Shapers.
Large Surface and General Purpose Wood Planing Machines.
Graining Machines; Tenoning Machines; Sand Belt Machine.
Swing Sawing Machine; Testing Machines for Threshing Machines.
Horizontal Boring Machines; Upright Boring Machines; Facing Machines.
Iron Turning Lathes; Iron Column Drilling Machines.
Iron Punching Machine; Punching and Shearing Machine.
Key Seat Cutting Machines; Cutting and Shearing Machines.
22 Spindle Gang Drilling Machines; Peaver Shears.
Large Iron Shaper, English make; Milling Machine.
Schenker Patent Bolt Cutting Machine.
No. 6 Northey Steam Pump; Large heavy Tumbling Barrels.
Steam Heater, 51 x 72 inches.
Bradley Cushioned Trip Hammer; Iron Boring Lathes.
Foundry 3 Legged Drop, 35 ft. high, 1100 pound drop; 37 inch Gear Wheel.
Steel Boiler, 68 x 168 inches.
Horizontal Engine, Cylinder 18 x 36.
Turret Head, Brown & Sharpe, Mill Screw Machine.
Leaf Water Wheels; Portable Engines.
Fairbanks' Platform Scales; Steam Pipe and Fittings.
Fire Extinguishers; Sand Blasts for sharpening or cleaning Files; Belting, Shaping, Hangers, Pulleys, Couplings.

Wrought Iron Heater for glue and wood; Circular Saws.

Joseph Hall Machine Works, Oshawa.
John Livingston, Trustee.

H. W. PETRIE'S list of Saw Mill and general Wood-working Machinery.

- ONE new 2 or 3 block saw mill with 64 inch saw.
- ONE saw mill with timber limit, in Parry Sound.
- ONE 3 block mill, Butterfield build.
- ONE 2 block mill, small portable size.
- ONE automatic sawing machine, Hayley make.
- ONE 66 in. inserted and one 64 in. solid saws.
- TWO saw cutters with parts.
- ONE gang lath mill, new.
- ONE Watrous self feed lath mill and bolter.
- ONE Goldie & McCulloch, Hall self acting shingle machine.
- ONE self acting shingle machine, Green Bros. make.
- ONE Watrous self acting shingle mill and jointer.
- ONE Eureka self acting shingle machine and jointer, 1. Frenchette maker, St. Hyacinthe P.Q.
- TWO Doherty hand sawing machines.
- ONE upright swing with 40 inch saw.
- EIGHT wheel jointers various makers.
- THREE drag saw machines.
- ONE heavy 24 inch planer and matcher, Rogers make.
- ONE new eclipse planer, matcher and moulder, Galt make.
- ONE 24 inch planer and matcher, Picton make.
- TWENTY inch planer and matcher.
- EIGHTEEN inch planer and matcher.
- LITTLE Giant pony planer and matcher.
- NEW Economist 24 inch planer and matcher.
- ONE 27 inch revolving bed double surfacer, Galt make.
- ONE 24 inch surfacer, McKechnie & Hertram.
- ONE 24 inch pony planer, Frank & Co. build.
- ONE 20 inch pony planer, Frank & Co. build.
- TWENTY-FOUR inch surfacer, Kennedy make.
- TWENTY-FOUR inch surfacer, hard wood bed.
- TWENTY-TWO inch surfacer, wood bed.
- EIGHTEEN inch surfacer all iron and steel.
- SIXTEEN inch buzz planer, Galt make.
- THREE side moulder, all brass heads, Rogers make.
- THREE side moulder No. 2, Cant Gourlay make.
- TWO one side moulders, McKechnie & Hertram make.
- ONE one side moulder wood frame.
- NEW 3 side moulder, Cant Bros. make, Galt.
- TENONING machine, double cope, Goldie & McCulloch.
- ONE J. A. Fay Tenoner, small size.
- TWO Rosstoners.
- ONE double cope tenoner, McKechnie & Hertram.
- BLIND slat tenoner, Cowan build.
- POWER morticer, Goldie & McCulloch build.
- TWO power morticers for heavy work.
- LARGE stock of foot morticers, new, at \$15 each.
- UPRIGHT boring machine with column.
- SIX power scroll saws, various makes.
- ONE 34 inch hand saw, Hamilton Tool Co.
- TWO new hand saws, Galt make.
- NEW 34 inch pedestal and 24 inch bracket hand saws.
- ONE upright Goldie & McCulloch shaper.
- NEW iron top shaper, Cowan make.
- SHAPER heavy iron column, Cant Bros. make, Galt.
- ONE wood frame shaper and counter shaft.
- ONE velocipede, foot power shaper, Barnes.
- ONE automatic handle lathe, Sheldon Bros.
- ONE handle or gauge lathe, Bailey.
- ONE arc handle or spoke lathe, new.
- ONE Blanchard spoke lathe, Fay make.
- ONE broom handle lathe, wood frame.
- NEW wood splitting machine. Send for photo.
- BORRIN lathe with cutters for cotton and woollen mills.
- ONE iron haul machine, American make.
- SET of hoop machines, Godrich make.
- SET match machinery for round matches.
- LOT of lumber and log cars for saw mill use.
- FOUR pole road cars 7 feet 10 inches gauge.
- Sand passer, new Galt make.
- FOOT mitering machine, Cant Bros. make.
- ONE chair mortising and boring machine.
- ONE set spike machines, Fay make, Cincinnati.
- ONE lathe grinder, Galt make.
- SIX saw bracket cutoff and ripping.
- ONE hand wiring machine.

TWO new wood turning lathes with rests, etc.

ONE heading and moulding attachment for planer and matcher.

LOT of moulding and matcher cutter heads.

SEND for list 13 and 14 and mention wants. Address H. W. PETRIE, Brantford.



SEALED TENDERS marked "For Mounted Police Clothing Supplies," and addressed to the Honourable the President of the Privy Council, Ottawa, will be received up to noon on Monday, 16th April, 1888.

Printed forms of tender, containing full information as to the articles and quantities required, may be had on application to the undersigned.

No tender will be received unless made on such printed forms. Patterns of articles may be seen at the office of the undersigned.

Each tender must be accompanied by an accepted Canadian bank cheque for an amount equal to ten per cent. of the total value of the articles tendered for, which will be forfeited if the party declines to enter into a contract when called upon to do so, or if he fails to complete the work contracted for. If the tender be not accepted, the cheque will be returned.

No payment will be made to newspapers inserting this advertisement without authority having been first obtained.

FRED. WHITE, Comptroller, N. W. M. Police.

Ottawa, March 12th, 1888.



TENDERS.

SEALED TENDERS, marked "For Mounted Police Provisions and Light Supplies," an addressed to the Honourable the President of the Privy Council, Ottawa, will be received up to noon on Tuesday, 15th May, 1888.

Printed forms of tenders, containing full information as to the articles and approximate quantities required, may be had on application at any of the Mounted Police Posts in the North-West, or at the office of the undersigned.

No tender will be received unless made on such printed forms.

The lowest or any tender not necessarily accepted. Each tender must be accompanied by an accepted Canadian bank cheque for an amount equal to ten per cent. of the total value of the articles tendered for, which will be forfeited if the party declines to enter into a contract when called upon to do so, or if he fails to complete the service contracted for. If the tender be not accepted the cheque will be returned.

No payment will be made to newspapers inserting this advertisement without authority having been first obtained.

FRED. WHITE, Comptroller, N. W. M. Police.

Ottawa, March 20th, 1888.

HOW WE USED TO DO IT WHEN I WAS A BOY.



THE above sketch by Hengough aptly illustrates the old style of doing things. In the next issue of the DOMINION MECHANICAL AND MILLING NEWS we propose to show pictorially how the thing is done in modern style. Those who have grain or potatoes still to market and therefore cannot afford to wait a month should write by post card for circular of the "DANDY" PATENT BAG HOLDER, which will last a lifetime and costs only 25 cents. Sample (free by express) on receipt of price.

C. W. ALLEN & CO.,
63 & 67 Yonge St., Toronto.

WHOLESALE AGENTS--For the Province of Quebec: Wm. Ewing & Co., seed merchants, Montreal; for the Northwest, J. H. Ashdown, Winnipeg.

\$1.00

Will pay your Subscription

TO THE

MECHANICAL AND MILLING NEWS

For One Year.

Correspondents' Opinions.

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

THE SHORT SYSTEM.

Editor Mechanical and Milling News.

BEAVERTON March 15th, 1888.

SIR, Allow me to say a few words in your valuable journal in regard to the short system. A great many millers and also mill furnishers say good work can't be done on three breaks, but my experience is different, as I have seen used 2, 3, 4, 5 and 6 breaks, and find the best work can be done on three, and very good work on two. I have lately started a small mill on the two break system, which I think would suit a great many small mills with light power. The following is a list of the machinery in the mill: Four pairs of rolls, 9x18, two corrugated for breaks, one scratch and one smooth; two small scalpers, 24 inches in diameter by 4 feet long; two Dobson's patent flour dressers, 8 feet long by 32 inches in diameter; one small purifier and the cleaners. This mill is making 250 lbs. of flour per hour, equal to any straight roller in the market. Bran weighs 35 to 40 per bag, and shorts 75 to 80 per bag.

Any person can see this mill at work, and where there is power to drive one run of stones with necessary machinery, there is power to drive a roller plant of above description. Hoping the above may be of some use to some brother dusty, I remain

Yours truly,

A. DOBSON.

OBJECTS OF THE CANADIAN ASSOCIATION OF STATIONARY ENGINEERS.

Editor Mechanical and Milling News.

SEND you by to-day's mail a few circulars and a copy of the constitution and by-laws of the Canadian Association of Stationary Engineers, with the object of acquainting manufacturers with the fact of the existence of our organization and its possibilities. In these times of labor organizations we seldom look at a newspaper but we see a record of strife between capital and labor. Often misdirected agitation encouraged by various means, some of which are almost criminal, causes a continual and costly strife, in which capital and labor alike suffer. This is carried on so universally that managers and employers have begun to look upon any organization, no matter what its objects are, with a certain degree of suspicion, and no thoughtful man can be surprised at this.

It is possible to have a union or association conducted upon such principles that the interests of the employer and employee will not conflict associating each together for the common good of all, increasing the knowledge of each individual member in the particular branch of industry in which he may be employed. There are two distinct and entirely different forms of organizations, and yet the uninformed may easily believe they are alike, from the fact of each being in a measure a secret society. I would like to call the attention of manufacturers to the principle aims and intentions of the Canadian Association of Stationary Engineers. Our plans are based on the recognition of the identity of interest between capital and labor. The first plank in our platform is to improve our members socially, mentally and morally, and fit them for higher and better positions in the mechanical world. Our constitution and by-laws clearly set forth the principle that the interests of the employer and employe are identical, and that as an association we cannot form a collusion with any of the trades unions. We invite employers generally to become honorary members of our Association. Our honorary members have all the privileges that the active ones have except that of voting. We have a few employers now with us, and we feel sure that very many more will join us when they understand our objects. Any employer who has a steam plant and an engineer will find it is to his personal and pecuniary advantage if he will assist his engineer to join, or join as honorary member himself. He might even do both without doing any injury to himself or his business. The association meets twice a month, and after routine business, spends from one to two hours in discussing practical points in steam engineering.

Yours respectfully,

A. M. WICKENS,

President Canadian Association Stationary Engineers.

PROPOSED AMENDMENTS TO THE GRAIN INSPECTION ACT.

AT a meeting of the grain section of the Toronto Board of Trade held on March 20th, the following proposed amendments to the Inspection Act of 1885, 48-49 Vic., chap. 66, were adopted, and it was decided to submit them to the Montreal Board of Trade for approval and embody them in a petition to the Dominion Government with the view of having the Act amended at this session of Parliament.

"Extra hard spring wheat shall be sound and well cleaned, weighing not less than 62 pounds to the bushel, and shall be composed of 95 per cent. of hard red Fife wheat, grown in Manitoba in the North West Territories of Canada.

"No. 1 hard spring wheat shall be sound and well cleaned, weighing not less than 60 pounds to the bushel and shall be composed mostly of hard red wheat, grown in Manitoba or the North West Territories of Canada.

"No 2 hard spring wheat shall be sound and reasonable cleaned, weighing less than 58 pounds to the bushel, and shall be composed mostly of hard red wheat grown in Manitoba or the North West Territories of Canada.

"No 1 northern spring wheat shall be sound and well cleaned, weighing not less than sixty pounds to the bushel, and shall be composed of at least fifty per cent, of hard red wheat, grown in Manitoba or the North West Territories of Canada.

"No 2 northern spring wheat shall be sound and reasonably cleaned, weighing not less than fifty-eight pounds to the bushel, and shall be composed of at least fifty per cent, of hard red wheat, grown in Manitoba or the North West Territories of Canada.

"No. 3 northern spring wheat shall comprise all wheat grown in Manitoba or North West Territories of Canada, fit for warehousing, and weighing not less than fifty-six pounds to the bushel, and not good enough to be graded as No. 2 northern.

"No 1 white Fife wheat shall be sound and well cleaned, weighing not less than sixty pounds to the bushel, and shall be composed of not less than 95 per cent, of hard white Fife wheat.

"No 2 white Fife wheat, shall be sound and reasonably cleaned, weighing not less than fifty-eight pounds to the bushel, and shall be composed of at least seventy-five per cent. of white Fife wheat.

"All barley grown in Manitoba or the North West Territories of Canada shall be graded as above, but shall be distinctly classified by inspectors as Manitoba barley.

UTILIZING WAVE POWER.

AFTER many accidents and trials the wave-power motor so long talked of has at last been finished and proved a success, says the San Francisco Call. The construction of this machine, or apparatus, which was begun in July, 1886, was at that time considered a hairbrained scheme, but the projectors stuck to their plan, and seem now to be in a fair way to success. Across the chasm in the rocks just north of Parallel Point a bridge of heavy timbers was built. Suspended from this is a huge fan or paddle of oak timbers, with the spreading portion downward. This is fastened to the bridge by immense hinges, which allow it, when in operation, to swing back and forward a distance of 36 feet as the waves strike it. The handle of the upper portion of the fan is connected with a solid plunger pump 12 inches in diameter and having a stroke of 9 to 12 feet. This pump, in turn, is connected with a suction pipe running out into deep water. The fan is so rigid that it can be drawn up out of reach of the waves when not in use. When a wave comes in the fan is thrown forward and forces the air out of the pump barrel in which the plunger works. On the wave receding the fan is carried seaward and the plunger is drawn out, causing a vacuum and a quick rush of water into the suction pipe. The force with which the water is drawn up is sufficient to raise it to an elevation of 350 feet above the tide level. Should this motor prove as successful as the projectors seem confident it will, several others will be built in the same neighborhood, and an immense reservoir built on the hill to contain the water. This one motor, with its 12-inch plunger is capable of raising 12,000 cubic feet of water 350 feet high in every 24 hours. The uses to which the water will be put are valuable. A 36-inch pipe will be conducted to this city, and water will be supplied to all branches of industry where machinery is used. Bathing houses will also be supplied with salt water, and sewers furnished when it is necessary. The first work performed will be begun in about ten days, and an 8-inch pipe is now being laid for the purpose. The last mentioned pipe is for Adolph Sutro, and is to be utilized in sluicing away a large amount of drifting sand from the heights just back of the aquarium.



IGNITION TEMPERATURE.—A blast at 800 degrees temperature will ignite charcoal, 900 degrees will ignite coke and 1,300 degrees will ignite anthracite.

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

WELDING MALLEABLE CAST IRON.—You can weld malleable cast iron plate by netting them together and using a flux of powdered borax and Norwegian or crucible steel filings, equal parts. Let the first blows of your hammer be tender ones to obtain good results.

GOOD AND POOR CONDUCTORS OF ELECTRICITY.—The best conductors of electricity are silver, copper, gold, zinc, platinum, iron, tin. The poorest conductors, or the best insulators, are dry air, ebonite, paraffine, resin, sulphur, sealing-wax, glass, silk, wool, dry paper, porcelain.

Dry pocket glue is made of 12 parts of good glue and five parts of sugar. The glue is boiled until it is entirely dissolved; the sugar is then put into the glue, and the mass is evaporated until it hardens on cooling. Luke-warm water melts it very rapidly, and it is excellent for use in causing paper to adhere firmly, cleanly, and without producing any disagreeable odor.

The first lucifer match in England was made in 1833, a little more than half a century ago, by John Walker, of Stockton-on-Tees. There was a match factory established in Vienna in the same year. For 14 years the persons engaged in making the old lucifers suffered from phosphorus necrosis. Amorphous phosphorus was substituted for the common kinds and a terrible disease banished from what has proved to be a useful and indispensable industry.

DETECTING BARYTES IN WHITE LEAD.—The most common adulteration of white lead is permanent white, or sulphate of baryta. The admixture may be recognised by boiling a small quantity of the pigment in a glass test tube or flask, with nitric acid diluted with an equal measure of water. The white lead dissolves, but the sulphate of baryta remains as a white residue. To prevent any chance of error, the residue should be allowed to settle, the clear liquid poured off, and the deposit again treated with nitric acid and then boiled with water.

A firm which makes a specialty of the erection of shafting, states that its experience teaches that the loss of power due to improper conditions in the line shafting amounts to fifty per cent of the engine power employed, and that the defects most commonly found are as follows: Shafting too light for the duty, crooked shafting, hangers too far apart, hanger bearings too short, pulleys too heavy and not properly balanced, hangers which are not adjustable and non self-adjusting, and sometimes filled with spurious Rabbit metal, and improper proportion between two pulleys connected by the same belt.

The Worcester, (Mass.) Gazette says: "Mechanics of adult age can easily remember when gimlet-pointed screws came into use within the last thirty years, superseding the blunt-pointed ones before used, and the former have been considered a modern invention. But we have lately seen half a dozen screws, with excellent gimlet points, which were taken from an old piano, and bear unmistakable evidence of age and of having been made before screws were made by machinery. The piano is inscribed 'Jacobus Kirckman. Fecit, Londini, 1755,' and the screws are doubtless of that date. The most curious point in the case is that after such screws as these had been once made, mechanics should have gone on using square-pointed screws for nearly a century."

Water gas may be defined to be the gaseous product resulting from the interaction of steam and carbon at a high temperature. Generally speaking, the mode of its manufacture is to pass superheated steam through a thick layer of white-hot coal. The result of the procedure will be readily understood by reference to the following explanation: The glowing coal (carbon) seizes upon the oxygen of the steam, uniting with it to form carbonic acid. (In chemical language, the reaction would be expressed by the formula $C + 2(H_2O) = CO + 3H_2$). The carbonic acid thus formed, however, is forced to pass through a considerable layer of glowing coal before it may escape, and in its passage through it, the white-hot carbon deprives the carbonic acid of one-half of its oxygen, reducing it to the state of the lower oxide or carbon, known as carbonic oxide. (This chemical reaction would be expressed as follows: $CO_2 + C = 2CO$). The product, which results from these several reactions, is, therefore, composed of four equivalents of hydrogen and two equivalents of carbonic oxide (i. e., $4H_2 + 2CO$). This product is what is known as water gas.

A UNIVERSAL SOLVENT.—The fury of the chemical domain is the element fluorine; it exists peacefully in company with calcium in fluor-spar and also in a few other compounds, but when isolated, as it recently has been by M. Henri Moissan, it is a radical gas that nothing can resist. It combines with all the metals, explosively with some, or if they are already combined with some other non-metallic element it tears them from it and takes them to itself. In uniting with sodium, potassium, calcium, magnesium and aluminum, the metals become heated even to redness by the fervor of its embrace. Iron filings slightly warmed burst into brilliant scintillations when exposed to it; manganese does the same. Even the noble metals, which at a melting heat proudly resist the fascinations of oxygen, succumbed to the chemical siren at moderate temperatures. Glass is devoured at once, and water ceases to be water by contact with this gas, which combining with its hydrogen at the same moment forms the acid glass-dissolving hydrofluoric acid and liberates ozone.

April, 1888

W. KING
DESIGNER
AND ENGRAVER
MELINDA AND JORDAN ST. ONT.

Victoria Wire Mills.

ESTABLISHED 1859.



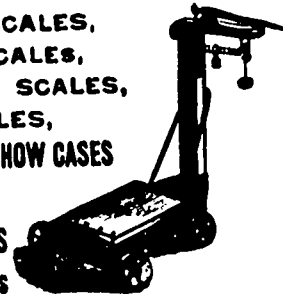
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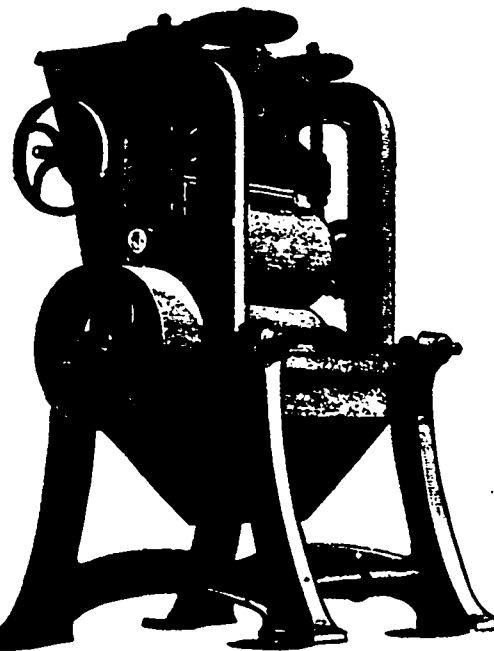
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THE LATEST AND BEST

FOR MERCHANT AND CUSTOM MILLS COMBINED.

This system has been demonstrated to be superior to any long system now operated. The machine used in the reduction of wheat and middlings is a Two-Roller Disc machine, one set of corrugated rolls for bran, one set of smooth rolls for germ, and one stone roll for purified middlings. This combination with proper bolting and cleaning machinery, will produce better results than if more machinery were used. The difference will be in the color of the flour.

CAPACITY—75 Barrels per Day from Fall Wheat.



JONES' SHORT SYSTEM FOR CUSTOM MILLS.

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

CAPACITY—50 Barrels per Day from Fall Wheat.

TESTIMONIAL

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

ABINGDON, September 18th, 1887

JAMES JONES, ESQ., Thorold, Ont.

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

Yours truly,

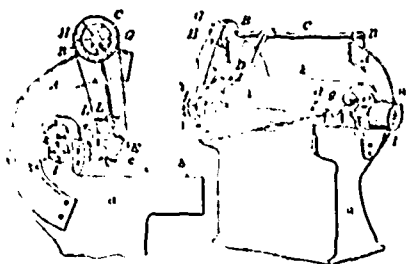
R. A. SHEPHERD.

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

Latest Canadian Patents.

Lathe for Turning Irregular Forms.

378,322. Peter Kettinger, Defiance, Ohio, assignor to the Defiance Machine Works, same place. Filed March 17th, 1887. Serial No. 231,227. Dated Feb. 21, 1888.



Claim 1. The combination of a lathe for cutting irregular forms, a swinging frame carrying an auxiliary cutter-head and provided with a shoe, and an auxiliary cam upon the live-spindle of the lathe to govern the proximity of such auxiliary cutter-heads to the blank to be operated upon.

2. The combination, in a lathe for cutting irregular forms where in a templet or cam on the live-spindle governs the proximity of the work to the revolving cutter-head or heads, of an auxiliary cutter-head, an auxiliary templet on the live-spindle to govern the proximity of the auxiliary cutter-head to the work, and a swinging frame in which the auxiliary cutter-head is journaled to swing it in and out of contact with the work.

3. The combination of a lathe for cutting irregular forms provided with a sliding bed, a swinging frame carrying an auxiliary cutter-head, an auxiliary cam upon the live-spindle of the lathe, and a standard rising from the sliding table and connected by means of a pivoted slotted link to the swinging frame.

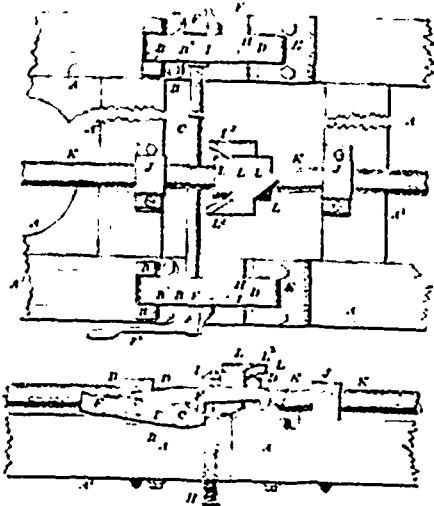
4. The combination, with a spoke-lathe, substantially as described, of an attachment consisting of a curved standard secured to the ends of the frame, a pendant swinging frame adjustably hinged to said standards, a revolving cutter-head journaled in said frame, and a cam or templet to govern the proximity of the cutter-head to the work.

5. In attachments for spoke-lathes of the kind described, and provided with a sliding table, A, the combination of the swinging frame A, the revolving cutter-head F journaled in said swinging frame, the shoe I, secured to said swinging frame, the templet or cam J, to govern the proximity of the swinging frame to the work, and the standard K and slotted link L, arranged to form an automatically operating connection between the swinging frame and the sliding table of the lathe.

6. The combination of the curved standards A, the shaft C, the adjustable bearings B, the swinging-frame D, the cutter-head E, and the drive-pulleys F, G and H.

Saw Mill Carriage

378,683. George M. Hinckley, Milwaukee, Wis., assignor of one-half to Edward P. Alth & Co., same place. Filed Oct. 12, 1887. Serial No. 252,135. Dated Feb. 28, 1888.



Claim 1. In combination with two saw-mill carriages or two sections of a carriage, each provided with suitable set-works a coupling device for connecting the two carriages or the two carriage sections, and a coupling device for connecting the set-shafts of the different carriages

2. In combination with two saw mill carriages or carriage-sections, hooks, as D D, pivoted to one of said carriages on its front and rear sides, and plates or keepers E E, secured upon the other carriage in position to be engaged by the hooks, whereby the ends of the carriage when brought together are prevented from moving relatively to each other.

3. In combination with two saw mill carriages or carriage-sections, hooks, as D D, pivoted to the longitudinal timbers of one of the carriages, plates or keepers, as E E, secured upon the other carriage in position to be engaged by the hooks, a rock-shaft extending transversely across one of the carriages beneath the hooks and there provided with arms F F', and a level Fa, secured upon the shaft.

4. In combination with two saw-mill carriages or carriage-sections, hooks, as D D, pivoted to one of the carriages, plates E E, secured to the other carriages in position by the hooks, a rock-shaft, C, journaled in the carriage carrying the hooks, a hub secured upon one end of the shaft and provided with a finger of arm, F', to project beneath one of the hooks, and a second hub secured to the opposite end of the shaft and provided with a similar finger, F', to project beneath the other hook, and provided also, with a lever or extension, as Fa.

5. In combination with two saw-mill carriages or carriage-sections adapted to abut squarely against each other, a coupling

device for the carriages or sections applied to the longitudinal timbers of the latter at both sides of the centre of the carriages, whereby the two sections are prevented from swinging or moving independently of each other.

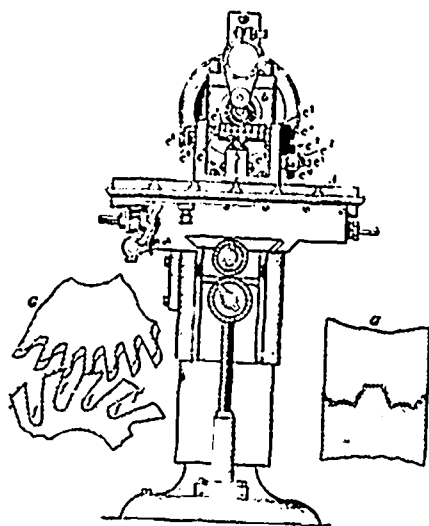
6. In combination with two saw-mill carriages or carriage-sections, plates or keepers E E, secured to one of said carriages, hooks D D, pivoted in the other carriage and adapted to engage the keepers, a shaft, C, journaled upon the carriage and provided with arms F', to extend beneath the hooks, and a lever, Fa, secured to said shaft C and adapted to rock said shaft.

7. In combination with carriages A A, provided with pivoted hooks or catches D D, and plates or keepers E E, a rod or stem, H, carried by each hook or catch, a stud or projection upon the lower end of the rod, a spring encircling the rod, bearing at opposite ends against the stud and a fixed part of the carriage, and nuts I, mounted upon the rod H and serving to adjust the spring.

8. In combination with two saw-mill carriages or carriage sections provided, respectively, with hooks D D and plates E E, a rod, A, carried by each hook, and a spring, G, encircling each rod and bearing at opposite ends against a fixed part of the carriage, and a shoulder or nut upon the rod.

Machine for Sharpening Milling Tools.

379,187. Charles H. Trask, Lynn, Mass. Filed March 28, 1887. Serial No. 232,705. Dated March 6, 1888.



Claim 1. The combination of the blank holder, C, carrying two or more arbors for supporting two or more gangs of tool-blanks, with two or more milling tools and means for moving the blank holder to present simultaneously two or more lines of tool blanks to the milling tools.

2. The combination of a blank holder, C, two or more arbors, each of which is adapted to carry or support a gang or group of tool blanks, and devices for rotating said arbors and locking them in any desired position, with two or more milling tools arranged to operate simultaneously upon each gang or group of tool blanks upon the movement of the blank holder in relation thereto.

3. The blank holder C, having two or more arbor holders, made in two parts, c c', and horizontally adjustable in relation to each other.

4. The blank holder C, having two or more arbors, D, with the gears e11, and the adjusting wheels e16, connected with the said gears to move them simultaneously.

5. The blank holder C, having two or more arbor holders, made in two parts, c c', and horizontally adjustable in relation to each other, and a locking device for locking them in any desired position, and the adjusting wheel e16, having the holes e17, and a locking pin, e21.

6. The blank holder C, having two or more arbor holders, made in two parts, c c', and horizontally adjusted in relation to each other, and a locking device for locking them in any desired position, and the adjusting wheel e16, the bracket or support e18, having a slot e20, and a block e19, to slide therein, carrying the stop pin e21.

7. The blank holders having the arbors D and means for locking them in any desired position.

8. The blank holder having the arbors D carried by the supports or brackets e4 e9, respectively, and one or more adjustable supports, c.

9. The combination of the blank-holder C, having the bolts e2, the brackets e4 e9, supporting the arbors D, and the said arbors D.

10. A blank holder, C, carrying an arbor adapted to be intermittently rotated and to be moved horizontally, in combination with a shaft carrying a milling tool upon an axis parallel with the axis of the arbor.

11. The combination of a blank holder carrying one or more arbors, each of which is adapted to support a gang or group of tool blanks, which arbors are adapted to be intermittently rotated, which blank holder has a horizontal movement, with a gang or group of teeth forming backing of tools arranged upon a shaft parallel with the centres of the arbors.

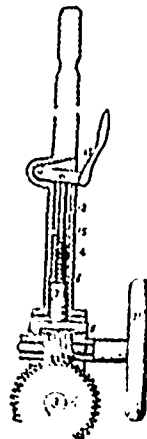
12. The combination, in a device for cutting tools, of a rotary shaft adapted to support a removable arbor carrying two or more milling or cutting tools, with a bed adapted to be reciprocated or moved horizontally, a blank holder supporting one or more tool blank supporting arbors adapted to be intermittently rotated or locked in any desired position supported by said bed and adapted to be turned thereon, whereby the tool blank or tool blanks are first adapted to be moved by the bed in one direction in relation to one form of milling cutter or cutters and are then turned to be moved in another direction in relation to the same milling tool or tools or other milling tools related by said shaft.

23. The method of milling tools, embracing the forming of circular blanks, mounting the same in groups or gangs upon one or more arbors carried by a blank holder, moving the blank holder and blanks to one or more milling tools arranged to cut on a line

parallel with the arbors, then turning the blank holder, and again presenting the blanks to one or more milling tools mounted upon a shaft or arbor parallel with that of the arbor or arbors of the blank holder.

Feed Device For Drilling Machines.

379,194. Benjamin F. Barnes, Rockford, Ill., assignor to the W. F. & John Barnes Company, same place. Filed Oct. 4, 1887. Serial No. 251,412. Dated March 6, 1888.



Claim 1. In a feed operating mechanism, the combination of a gear wheel, a screw mounted in a bearing slidable in a right line toward and away from the gear wheel, and a spring for holding the screw in engagement with the gear wheel.

2. The combination of a hand lever, a gear wheel mounted in said lever, a bearing slidable in longitudinal parallel ways a screw supported in said bearings, and means for sliding the bearings, and hence the screw, away from and toward the gear wheel.

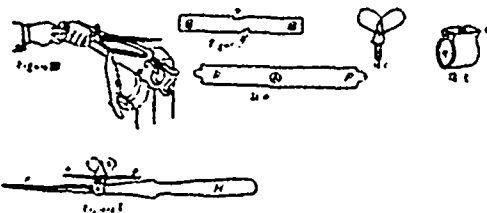
3. The combination of the hand lever, a gear wheel mounted in said lever, a bearing slidable in longitudinal parallel ways, a screw supported in said bearing, and a thumb lever connected with the bearing for disengaging the screw from the gear wheel.

4. The combination of a hand lever, a gear wheel mounted in said lever, a bearing slidable in longitudinal parallel ways, a screw supported in said bearings, a spring for holding said screw in engagement with said gear wheel, and a rod connecting the slidable bearing with the thumb lever for disengaging the screw from the gear wheel.

5. The combination of a pivoted hand lever, a gear wheel mounted in said lever, a screw bearing slidable in longitudinal parallel ways, a screw mounted in the said bearing, means for sliding the bearing, and hence the screw, toward and away from the gear wheel, and a hand wheel to rotate the screw.

Machines for Sharpening Saws.

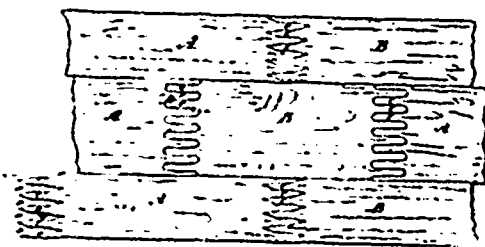
28,494. William Ruttan, Picton, Ont., dated 4th February, 1888.



Claim.—1st. The rake guide B, B, with slotted sides, in combination with the level guide P, P, substantially as and for the purposes hereinbefore set forth. 2nd. The level guide P, P, secured as above described, in combination with the rake guide B, B, substantially as and for the purposes hereinbefore set forth.

Splicing Lumber.

28,489. William L. Earing, Brockville, Ont., dated 7th February, 1888.



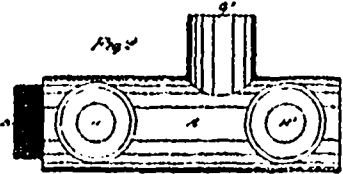
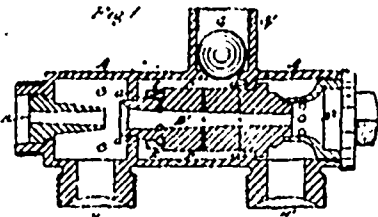
Claim.—The improvement in the art of splicing lumber, which consists in slotting the pieces to be joined lengthwise from the end, the intervening tenons parallel and slightly exceeding the slots in width, bevelled or rounding the ends of the slots and tenons to coincide, cementing the contact edges of the joint and driving the pieces endwise together, whereby the tenons will be compressed laterally together, and the bevelled or rounded ends crush into the bevelled or rounded ends of the slots throughout the whole thickness of stuff, to make an almost imperceptible and practically unbreakable joint, as set forth. 2. A joint or splice formed by slots D and tenons C cut endwise in pieces of board to be joined, the tenons bevelled or half round at the points, and the slots bevelled or half round at the ends, the tenons having parallel walls for a portion of their length and slightly exceeding the slots in width, the joint glued and the pieces driven endwise together, as set forth.

Steam Injector.

28,462. Thomas J. Carroll, Hamilton, Ont., dated 4th February, 1888.

Claim.—1st. The combination, in a steam injector, of the body A, having seatings a and a' for the delivery jet B1, and valve ring E, substantially as and for the purpose hereinbefore set forth. 2nd. The combination of the body A, ball-valve G, the perforated delivery jet B1 with its ring E, substantially as and for the purpose hereinbefore set forth. 3rd. The combination of steam inlet jet B, delivery jet B1, ring E, cap B2, valve-ball G, with body of injector

A living settings *a* and *a'*, substantially as and for the purpose hereinbefore set forth.



Grain Cleaning and Separating Mill.

28,495. Moritz Grollmund, Fergus Falls, Minn., U.S., dated 7th February, 1888.

Claim.—The combination of a shoe having an opening in one side, a series of sieves one above another in said shoe, a spout secured at the lower end of said sieves and adapted to receive the filings from all of them, a removable spout at the lower end of the uppermost of said sieves and projecting over said spout, and a removable cross-piece adapted to be diagonally inserted between two of the lower sieves.

GRINDING AND SETTING CUTTERS.

THIS is one of the most important features in a successful operation of the planing mill. The method of grinding cutters most commonly practised is a poor one, resulting not only in a loss of time, but of cutters as well. This plan consists in grinding a single bevel upon the edge of the cutter, sometimes very short, especially if the grinding apparatus works slowly. When a cutter, ground in this manner, has been sharpened a few times with a file a rounding edge is produced, unless a good deal of time and care is used in performing the operation of filing, and the wood is thus pounded or bruised off instead of being cut. Any one accustomed to operating planing machinery can tell instantly by the sound a machine makes whether the cutters are cutting or pounding the wood. The short or filing bevel is just as strong and no more liable to spring or fracture. By grinding the second bevel, the iron is removed, thereby rendering it an easy matter to keep the edge filed and sharpened; it also enables the operator to keep a smooth edge upon them, an edge made by the grindstone being unfit for use until the roughness has been removed by whetting. The best machine for grinding planer knives is an emery wheel, about 24 to 30 inches in diameter, and two inches thick, of a coarse grade, arranged with an automatic carriage for holding them. Such a machine well made and kept in good repair, will perform its work very rapidly and accurately.

After the knives have been ground they must, if the cylinder is to run steadily, be properly balanced. This can be done easily and quickly by using a pair of balances and grinding from the back, between the bolt slots of the heaviest cutter. If the cylinder is rectangular, *i. e.*, with an even number of cutters, it is only necessary to have each cutter of the same weight as the opposite one, but if the cylinder is triangular, they must all be of the same weight. In balancing long knives, care should be taken to remove as nearly the same amount from each bolt slot as possible, that one end may not be heavier than the other, for should this be the case, the cylinder could never be made to run steadily, but would have a jarring motion, producing a bad affect upon the work and bearings.

One of the most important points to be noticed in connection with this subject is the angle at which the cutters stand to the surface being operated upon, and herein lies the whole secret of a planing machine performing the work without tearing or slurring the surface of the board. This is a matter with which operators should be better acquainted than the makers of the machine, as they have an opportunity of observing the effect of cutters at different angles and upon various kinds of wood, while the builder has not, but must make his designs more from theoretical deductions than from practical experience.

It seems to have been the aim of most builders to get as low or accurate an angle on as thin an edge for the cutter as possible. Now what is really wanted is a sharp edge, and any mechanic knows that it is will nigh impossible to keep a thin edge sharp; as, if it is thin, it must necessarily be of a low temper to avoid the danger of breaking. On the other hand the more obtuse the angle and the thicker the edge to a certain degree, the higher the temper of the metal may be, and the longer it

will retain its sharpness. That a given amount of wood can be removed with less power by use of a thin knife than a thick one is evident, but there are cases where the power consumed becomes a secondary consideration and the quality of the work turned out the first.

When knives stand at an angle suitable for soft woods, and it is desired to plane hard or cross-grained lumber, very good results may be obtained by grinding a slight bevel upon the face of the cutter, which is, in fact, changing the cutting angle.

PERSONAL.

Items of personal intelligence from or concerning persons engaged in the various branches of mechanical industry represented in Canada will always be welcome to this column, with the stipulation that the name of the sender be given, not for publication, but as a guarantee of good faith.

Mr. W. H. Pratt of the Conger Lumber Co., has returned to Toronto from California.

Mr. Wm. McDonald, head man at the Lucknow, Ont., saw mills, broke his leg last week while unloading logs.

J. L. Walterhouse, representing the Geo. T. Smith M. P. Co., of Stratford, Ont., was at the Douglas House, Winnipeg, last week.

Mr. Rogers, lately employed in McMillan's mill Winnipeg, has been engaged by the proprietors of the mill at Cristal City, Man.

Mr. R. Whitelaw, Woodstock, Ont., is at McGregor, Man., superintending the erection of machinery in a flour mill there.

Mr. Thomas S. Williamson, proprietor of the Norfolk House, Simcoe, Ont., and joint owner of the Simcoe roller mills, is dead.

William Smith, employed at Jas. Matheson's saw mill, Port Elgin, Ont. was instantly killed on March 7th, while adjusting a driving belt.

The death is announced of Mr. Thomas Lester, who for many years carried on an extensive lumbering and milling business at the village of Indiana, Ont.

George Potter, an old employe of M. Brennan & Sons, Hamilton, Ont., had his left arm completely severed from his shoulder while working at a planing machine last week.

A young man, named A. Churlton, while working in Jones' mill, at Wiarton, Ont., had both legs cut off and was otherwise mangled by a circular saw. He died in a few minutes.

Reports from Florida state that the health of Hon. T. B. Pardee, Ontario Minister of Crown Lands, is considerably improved. The hon. gentleman is expected to return home shortly.

Mr. Benjamin J. Morgan, of the firm of Morgan Bros., millers, Hamilton, Ont., died after a very short illness on Monday, 12th March. He was a highly esteemed and valued citizen, and was only in his 43rd year.

Says the London *Free Press*: A couple of days ago Mr. James Muirhead was practising with a pistol, and aimed at a pigeon in the mill yard. He was dead on the bird, but as he forgot to remove his left forefinger from the muzzle of the pistol, the result of the shot was worse for the shooter than for the bird, and Mr. Muirhead is now going around with the remains of the finger done up in a rag, and the pistol was sent home without further trial.

We regret to learn from the *Northwestern Miller*, that H. Watters, a millwright in the employ of R. Muir & Co., has been having a serious time at Winnipeg with erysipelas. He was first taken while superintending the erection of a mill for that firm at Millwood, Man. His face was then affected, and so seriously ill did he become that for several weeks his life was despaired of. He finally recovered, however, but in a few days bruised the middle finger of his right hand, which brought on erysipelas again. This necessitated the amputation of the member on the 9th inst. Mr. Watters, though a man 63 years of age, and subject to great pain, is standing the trouble wonderfully well.

Mr. W. D. Matthews, grain merchant, of 26 Front Street East, Toronto, died on Monday, 19th inst., at Leroy, N. Y., after an illness of three months. He was in his 67th year, and was born in the village of Burford, Brant County, in 1822, where his father, Abner T. Matthews, had carried on extensive operations in flour and lumber milling. He was married in 1844 to Miss Maria S. Colton, of Erie, Pa., and shortly after opened a flour mill at Rockwood, Ont. He removed to Toronto in 1856, where he has ever since carried on an extensive trade in flour and grain. He was well known among the farmers as the Barley King, his firm being one of the heaviest buyers of barley and other grain direct from the farmer in the province. Mr. Matthews was highly esteemed, and in his religious as well as business relations, won the respect and confidence of all.

G. A. Grier & Co., Ottawa, have sold out their lumber business and limits to J. L. Pierce & Co., of London, Eng.

Mr. Burns, M. P. for Gloucester, N. B., while in England, recently, organized a syndicate with a capital of \$255,000 to operate 700 square miles of timber limit on the Lower St. Lawrence. It will be known as the St. Lawrence Lumber Co., and Mr. Burns will manage the business.

In speaking to his motion for the appointment of a select committee of the Legislature to inquire into the extent and nature of the timber and mineral resources of Ontario, Mr. Meredith gave the following statistics to show the value of our timber resources: From 1868 to 1887 inclusively, the amount which Ontario had received from woods and forests, including the amounts derived from the sale of timber limits, was \$70,856,568.53, or an average of \$544,328 per annum. In the same twenty years the total exports from the whole Dominion of the products of woods and forests had been \$446,887,519, or \$22,440,379 per annum.

A correspondent of an exchange, who has had an experience of nine years in the semi tropical countries, says there are almost as many different qualities of mahogany as pine. It is scattered over the vast coast lands of Yucatan, British Honduras, Gulf Dulce, Honduras, Musquito shore and the Spanish main. The forests are literally tropical jungles, and none but experienced native hunters are able to travel through them. St. Domingo and Cuba are mountain wood fine grain, figured and best fit for furniture. Bay wood, north of the Belize river, has stood the highest tests in the British navy yards as a ship building timber. The wood of the Dulce, Honduras and Musquito shore is generally plain softer wood, much used for railway passenger car building, and general manufacturing purposes. Molders' patterns made of mahogany do not shrink or warp, and weavers' shuttles made of mahogany wear forever, and a day longer. Mexican mahogany comes nearest to bay wood, as it has a very similar habit. The mahogany tree acquires full growth in 30 years.



Wm. & J. G. Greey have received an order for a No. 1 Welch heater from J. D. Saunby, of London, Ont.

McKenzie Bros., of Kirkfield, Ont., are putting in a Welch wheat heater for improving the color of their flour, and have placed their order with Wm. & J. G. Greey, of Toronto.

Messrs. R. Hurdman & Co. of Ottawa, have lately refitted their mill throughout with about 3,000 feet large sizes of the "Monarc" unstitched rubber belting, made by the Gutta Percha and Rubber Manufacturing Company, of Toronto.

The mill of Jas. Mahaffy, of Port Albert, Ont., lately changed to the roller system with a capacity of 75 barrels per day, has just been completed by Wm. & J. G. Greey, of Toronto. Mr. Lawrie was up there last week giving it the final adjustment.

Wm. & J. G. Greey have completed the work of changing over the mill of Wm. Bradley, at Flesherton, Ont., to the full roller process, and their Mr. W. S. B. Lawrie was up there last week starting and adjusting the operation of same. The mill has a capacity of 50 barrels per day, and when Mr. Lawrie left was doing a lively gristing trade.

Mr. E. P. Cave has completed the millwright work on the mill of Mr. James Lillburn, at Holland Centre, Ont. In this mill, the rolls are coupled together and driven from one end with noiseless belt drive. We are informed the start was a most successful one, and the mill got down to good results at once. The plans, flow sheet and all machinery were furnished by Wm. & J. G. Greey, Toronto.

Mr. W. S. B. Lawrie has been down to Radford, Que., starting up the new roller 50 barrel mill of Mr. James Wilson at that place. He reports that the mill started up without a hitch of any kind, and that the results of its operation are highly satisfactory to all concerned. The plans, flow sheet and machinery were all furnished by Wm. & J. G. Greey, of Toronto.

Mr. Anthony Goettler, of Sebringville, Ont., has decided to change his mill over to the full roller process, with a capacity of 75 barrels per day, and has closed a contract for the whole work with Wm. & J. G. Greey, of Toronto. The machinery will consist of 10 pairs of rolls wheat cleaners, purifiers, flour dressers, scalpers, dusters etc. Work is to be commenced on the 15th inst. The rolls are to be coupled together, and driven from one end with rope drive.

Mr. W. S. B. Lawrie is at present at Port Hope, starting up the 100 barrel full roller mill of P. M. McCabe at that place. The machinery and plans were furnished by Wm. & J. G. Greey, of Toronto. The rolls, 6 double sets, are all coupled together and driven on one end with noiseless light rope drive. The differential on the rolls is obtained by noiseless wood and iron tooth gear. The millwright work was under the superintendence of Mr. W. B. Jackson, who built several mills for the Greey firm in Manitoba and the Northwest.

The Toronto bag works of which Messrs. Dick, Ridout & Co. are proprietors, were moved about the end of last year into their new large factory on Bay street, and last month witnessed a completion of their bag department. Their fine new engine has now been started up, and the temporary one which they have been using since the end of the year, removed. A short description of the premises may be interesting to our readers. The building is a handsome and substantial structure of red brick with stone foundations, four stories high, fronting on Bay Street, and lighted on three sides, and is a block above where the new C. P. R. station is to be erected. On the basement are the engine and heavy machinery, and on the middle flats the cutting, sewing and other light machines, all of special improved pattern. There are also large presses for printing jute and cotton bags, and smaller presses for salt and grain sample bags, etc., also full fonts of type and a large stock of expensive plates for printing the large bags. The firm claim that they are the only firm in Canada who do this class of work complete on their own premises, and they have brought it to a high state of perfection. The upper flat is at present used for storage, but no doubt the increasing business will soon crowd that out to another building and fill up the whole with machinery. The engine and boiler are of a capacity of about 60 horse power and were built by the Messrs. Doty & Co. The boiler is in a separate building, the setting of which, designed for the economy of fuel, is a notable feature. The boiler house and chimney have wisely been made large enough to hold another boiler of equal capacity, and it is the intention to duplicate both engine and boiler at as early a date as the increasing business will permit. The firm have had considerable inventive and constructive energy engaged on their machinery, and several of their best machines and processes are protected by patents and confined to themselves in the meantime. Attention is directed to the new and enlarged advertisement of this enterprising firm in the present number of this journal.

Enough is known concerning the geology of this country to make it reasonably certain that it is the storehouse of vast mineral deposits of exceeding great value. Consequently the report of the Royal Commission appointed by the Ontario Government to enquire into and report upon the extent and nature of the mineral resources of this Province, will be awaited with much interest. The development of our mines should proceed side by side with the growth of our manufacturing industries.

POINTS FOR MILLERS.

THE number of breaks employed in the long system varies from five to eight, and it is not surprising that the short system can vary from two to four, and each be satisfactory to the user. This various adaptation is necessary to meet the different requirements of the trade, different wheat, different climate, and different ideas of men who like ways of their own. But I would like to say, that the degree of perfection with which wheat is cleaned, has a great deal to do with deciding the number of breaks necessary

* * *

Plenty of roll surface, and even light teed, has much to do with the quality of work and determining the number of breaks, but the fact seems to be well demonstrated that on winter wheat three breaks is the correct number for a well granulated product and a good clean-up.

* * *

Talking of differential corrugations, many seem afraid of a high differential, such as five or six to one. Why should they be? Have they forgotten that the differential on the millstone, with an area of grinding surface many times greater, was one hundred and twenty to two hundred to one? I do not believe that rolls need to run six hundred to a thousand revolutions per minute, but I believe that on an abrupt reduction system, on nearly every reduction from first to last a high differential proves an advantage in the quality of work done. This need not be obtained so much by increasing the speed of the fast roll as by decreasing the speed of the slow roll. Can any one give me any good reason why the slow rolls need to run one hundred and fifty to two hundred and fifty revolutions per minute? It is not necessary to prevent uneven wear of corrugations, for sixty revolutions is enough for that, nor is it necessary in order that the rolls may take their feed. The above theories seem to be generally accepted, but any one who will try the experiment will be surprised to find they are entirely wrong in such reasoning. I think makers of rolls are afraid they cannot make a showing of using light belts and maintain a high differential, and therefore cultivating a wrong impression. But if more effectual work is demonstrated the miller will gladly stand the expense of heavier belts.

* * *

I have noticed an unwise habit of storing oil in the mill's basement, where the fifth and danger of spontaneous combustion is a very objectionable feature. It does not cost much to build a little house to hold oil at a safe distance from the mill, and it would be wise to have a separate oil house on the grounds of increased safety and cleanliness. I would engage to build a sufficiently good oil house anywhere for twenty dollars, and would consider it a valuable adjunct to any mill not provided with a separate protected room.

* * *

Having examined many samples of cleaned wheat under the glass, I am of the opinion that the larger part of the seam dirt comes from the fuzz end of the berry, which is not scoured off, as it should be. If seam dirt champions would spend much time in examining their wheat under the glass, and persevere in wheat cleaning until the glass failed to reveal a single bit of fuzz going to the rollers, they would suddenly conclude that seam dirt was a small quantity after all. If I can say anything that leads to this, I shall have done some good in the world.

* * *

I often notice the advice to feed right on your wheat scourers. This advice is as apt to be wrong as it is to be right. I have experimented on feed with many scourers, and do not believe there is a smutter made that you cannot err with as much on feeding too light as too heavy. Most of the scourers are constructed on a principle by which the wheat is largely scoured by friction on itself, and should be kept quite full to accomplish this, and if lightly fed more grain is broken and lost in screenings. Horizontal scourers, with spiral beaters, seem to accomplish most by the metal surfaces, but even these need to be fed to a certain fullness, according to the speed, to do good work. Every miller, having a scourer and brush polisher, should by thorough experiment and examination with the glass, ascertain just how fast to feed those machines to accomplish the best results, and adhere strictly to that capacity. If you cannot accomplish the perfect scouring and polishing that I have intimated is desirable, machines should be added to accomplish it, and the capacity should be so sufficient as that all wheat cleaning could be done by the light of day. Believing that wheat cleaning should be as perfect as possible, I hold that it should be accomplished by daylight, under careful inspection. I am utterly opposed to any night cleaning. Most millers do not

believe or practice this plan, but it is because they do not realize its importance. Really, I have been surprised at seeing fine, large mills, employing fifteen to twenty reductions with elaborate separations, having two or three cleaning machines, and they of so small capacity as to require almost constant running night and day to feed the mill. The wheat cleaning machines, according to my idea, should be numerous enough and of sufficient capacity to perfectly polish each berry, to do all cleaning by daylight, and also to provide against any temporary stoppage by reason of belt repairs, or similar causes. I have never felt altogether sure of my night milling, and have been surprised that it proves as good as it does. Given the best running, best lighted, and in all respects the best mill, and a miller cannot so well judge its products by night as by the clear light of day. I want to have my mill perfectly regulated by daylight, and have guarded any chance by night, therefore I want the wheat cleaned by daylight, and all elevating and other work affecting motion and requiring separate attention out of the way, that the mill may be regulated before dark, and right glad am I when daylight comes and discloses correct work. There are millers who never seem to be watching their mills very closely, acting as though they felt that their presence was a kind of inspiration to the machines among which they moved, and that eyes and brains are not particularly essential. I have never yet been able to feel that much at rest in a mill, and I have my doubts about such millers being profitable to their employers.

* * *

There is soft flour and there is soft flour. Flour can be soft and be granular, silky, sharp, lively and strong, and that is just what all flour should be. The miller should have that delicacy of touch in his fingers that he can readily distinguish this. But flour can be soft and be lacking in these qualities, though made from the same stock, and why? Simply because in the first case the particles are granular or cube shaped, and in the latter they are flat. The granular flour best absorbs water, and is best acted upon by the gases generated in fermentation, hence it is called the strongest flour. I consider that soft, flat flour is in all cases the result of too much feed for the reduction surfaces it has to pass over, and the close adjustment of the reduction rolls. Given a certain amount of stock to reduce, the finer you attempt to reduce it the more reduction surface is required, because provision must be made for the spread of the stock; hence the mill that provides the longest reduction surface for a given amount of stock, will yield the most granular product. This is the truth, regardless of the number of reductions employed. There is, therefore, no reason why a short system should not make as granular flour as a long system, if the reduction surface is sufficiently long in proportion to the close contact of the rolls and the amount of feed.

* * *

There is something fascinating about milling which enthralls millers to a degree that often leads them to too great risks and consequent failures. The enticing description of new machines, the expected improvement of water power, the desire to do a big business, and other reasons, lead to risks too great, so that a fire, a freshet, a poor season or poor credits may cause ruin. Milling business, like a bank, should have a good reserve.

* * *

One of the worst enemies to good milling is a class of bipeds known as mill proprietors' sons. It is usually at the age when the head is large and soft, and the bump of conceit abnormally developed, that the consciousness of their sonship leads them to feel an inflation of authority and cussedness. The proprietor's son pours in the sweepings and damaged wheat when you are making a run on choice stock, goes about screwing up rolls and changing the head miller's adjustments, and just when he should be around for necessary help he is far away playing base ball. How often doth the mill owner's son vex the head miller, and arouse his ire without the corresponding satisfaction of raising his boot?—"Jackstick," in *Modern Miller*.

James D. Leary, the builder of the big raft which was lost at sea in December last, has a timber ship in course of construction on the ways on which the raft was built, at Port Joggins, N. S. It is to be about six hundred and fifty feet long, one hundred feet longer than the raft. It will be built in the same general way as the raft, only the ends will be sharpened, and will be bulk headed to resist the action of the waves. This raft will be ship-rigged, with six large masts and will need no tugs. A large gang of men has been at work for several weeks, under the supervision of H. R. Robertson, who built the raft, hauling the huge timbers, which are being chained together into one giant bundle. The timbers are by far the largest that have ever been shipped from Nova Scotia. The work is about half completed, and the monster will be ready to launch some time in July or August. The cost of construction will be nearly half as much again as that of the raft.

ELECTRICITY CONVERTED INTO POWER, HEAT AND LIGHT.

IN an address to the members of the Canadian Association of Stationary Engineers at Montreal, recently, on the above subject, Mr. J. Thompson, of the Royal Electric Light Co., said that electricity, which was one of the most useful of the known forces, though somewhat hidden in nature, had within the last twelve years entered into nearly every branch of manufacture and by its aid we are enabled to produce effects in many cases hitherto thought impossible. Also by its help we may utilize the natural sources of power, such as waterfalls and rapids, to produce light, heat and power at a distance of miles from the source thereof. In other words, power that is now running to waste can be used to generate electricity, which can be conveyed over a wire almost any distance, say ten, twenty, or thirty miles, and there made to reproduce power light or heat as required. He referred to the utilization of the Falls of Montmorency for the lighting of the city of Quebec, in which ten circuits of No. 6 copper wire, each 32 miles long, are used, making in all 320 miles of wire. These circuits are, without doubt the longest electric light circuit in the world. They cover 500 arc lights, or about 400 electrical horse power. The time is not far distant when the falls of Niagara will be used to supply light, heat and power to the cities within a radius of 100 miles. Electricity has many uses, one of the most important being the production of light, the so-called electric light. Electricity in producing light also produces heat; in fact in the voltaic arc we have the greatest artificial heat known. There is no material on the earth that will withstand its heat, for what it cannot melt or burn it vaporizes. He showed a piece of mica, which it is well known will resist almost any heat, but which melts like glass in the arc. (The lecturer here showed glass melting, steel burning, copper melting, cast iron melting and wrought iron first melting and then burning.) The lecturer then showed an electrical stove consisting of six arcs, also another stove consisting of German silver wire. When the current is passed through these the arcs and wires become hot, and are ready to be utilized to cook. We can reproduce power from electricity, in fact, the time is not far off when small steam engines will no longer be used in cities, for all power will be supplied from a central point, where there will be located a large steam power (that is where water power is not available.) In this plant large boilers, large compound engines and motor dynamos will be used. For instance, in Montreal there could be erected a large steam plant of say 5,000 horse power on McGill between Wellington and Common streets. Water could be got from the river for making steam and condensing purposes. Wires leading from this point could be carried to any part of the city where power is used. Nearly all the large cities in the United States are starting power plants and they are increasing daily. We also find that the electric motor is taking the place of horses for propelling street cars, and there is quite a number of roads using this method in the States. The only road in Canada that has adopted this system is the St. Catharines & Thorold, and I understand that it is giving general satisfaction and costs much less than horses. The power is water from the Welland canal at St. Catharines. The lecturer then described the electrical motor, and showed experiments with it, such as working a blowing fan. In conclusion he described the process of electrical welding, showing that when two pieces of metal are placed in a current of great intensity the ends in least contact become heated to smelting points.

FLAMELESS COMBUSTION OF GAS.

SOME interesting experiments made by an English chemist appear to have proved, not only the possibility of a flameless combustion of gas, but also to have practically demonstrated the enormously high temperature capable of being obtained by such flameless combustion. Taking a ball of iron wire, about three pounds in weight, the experimenter placed it on a slip of fire-clay, and, directing a blow-pipe on it for a few seconds the wire began to fuse and run into drops, the temperature being steadily maintained; the room was darkened, but the closest examination showed not a trace of flame, though the fact that the glass was being constantly consumed was proven by repeatedly extinguishing and relighting it. The same experiment was repeated in another form by directing the flameless heat into a small fire-clay chamber in which a refractory clay crucible, made especially for nickel melting, was partially fused and worked into a ball like soft putty—the sides of the fire-clay chamber being at the same time fused the heat was so great that the blow-pipe laboratory was much too hot for comfort, even during the evening succeeding the experiment.

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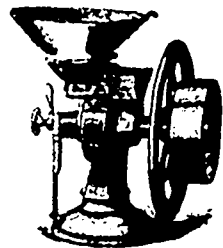
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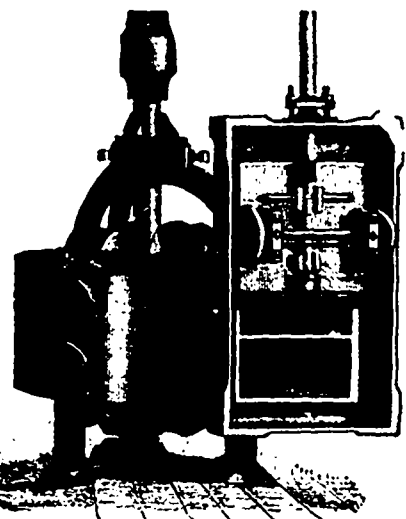
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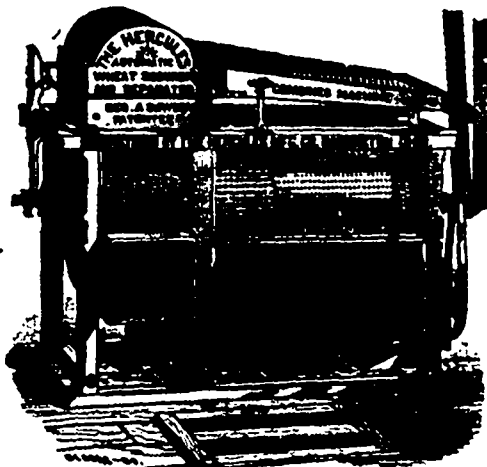
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Green sand castings are 6 per cent. stronger than dry sand castings.

Cast-iron will expand and contract between the extreme ranges of temperature in this country with a force equal to 4 1/2 tons per square inch of surface exposed.

Wrought iron expands and contracts between extreme ranges of temperature equal to nine to one per square inch of extension.

One gallon, U. S. standard, contains 231 cubic inches; weight of water in same 8.23; one cubic foot contains 7.4805 gallons of water.

The velocity of steam, of atmospheric pressure flowing into a vacuum is 1,660 feet per second.

To find the pressure in square inches of a column of water multiply the height of the column in feet by 4.34.

The proper safe working load for wire rope is as follows: One-half inch in diameter, 1,000 pounds, five-eighths inch, 1,500 pounds; three fourths inch, 3,500 1 inch 9,000 pounds. This is for 19 wires to the strand, hemp centers.

To find the diameter when the circumference is known, multiply the circumference by .3183.

To find the area triangle, multiply the base by one of the height.

No 1 wire gauge sheet iron weighs 12 1/2 pounds per square foot; No 2 iron, 12 pounds; No 3 iron, 11 pounds; No 4 iron 10 pounds; No 5 iron, 9 pounds; No. 6 iron, 8 1/2 pounds; No. 7 iron 7 1/2 pounds, No 8 iron 7 pounds.

To find the lap required on a slide-valve to cut off steam at three fourths stroke, multiply the stroke of the valve in inches by 250, the product is the lap in terms of the stroke. To cut off at two thirds stroke, multiply by 289, lead not considered. *Journal of Progress*

THE ST. LAWRENCE ROUTE.

At a recent meeting of the Montreal Board of Trade resolutions were passed urging the Dominion Government to assume the St. Lawrence river debt and abolish harbor dues at the port of Montreal. W. W. Ogilvie pointed out that under the present circumstances Canada is not able to handle the grain crop of the Northwest, which is going by way of New York and other American ports. To his knowledge at the present time there are 3,000,000 bus. of Manitoba wheat at Port Arthur, 500,000 bus. of which will be shipped by New York, but not one bushel will be taken by the St. Lawrence route. He himself has to charter American vessels to carry grain, as under circumstances Canadian vessels can not take it. It was stated by other speakers that whereas in 1880 18,000,000 bus. of grain had been delivered by the Lachine canal last year only 8,000,000 bus. had been delivered, while the Erie canal delivered 48,000,000 bus. American ports were generally abolishing all charges, and if Montreal did not wake up, would soon carry off the whole of the Canadian trade.

A NEW SOLDER.

A SOFT alloy which will adhere so firmly to metallic, glass and porcelain surfaces that it can be used as a solder, and which is invaluable when the articles to be soldered are of such a nature that they cannot bear a high degree of temperature, says the Boston *Journal of Commerce*, consists of finely pulverized copper dust, which is obtained by shaking a solution of sulphate of copper with granulated zinc. The temperature of the solution rises considerably, and the metallic copper is precipitated in the form of a brownish powder 20, 30 or 36 parts of this copper-dust, according to the hardness desired, are placed in a cast-iron or porcelain lined mortar, and well mixed with some sulphuric acid having a specific gravity of 1.85. Add to the paste thus formed 70 parts (by weight) of mercury, constantly stirring. When thoroughly mixed, the amalgam must be thoroughly rinsed in warm water to remove the acid and then set aside to cool. In ten or twelve hours it will be hard enough to scratch tin. When it is to be used it should be heated to a temperature of 375 degrees C., when it becomes as soft as wax by kneading it in an iron mortar. In this article state the Scientific American says, it can be spread upon any surface, to which, as it cools and hardens, it adheres very tenaciously.

Canada is finding, to her cost, that the Merchandise Marks Act will operate as unfavourably against her goods as against any of the foreign frauds it was primarily intended to pillory. Canada contains a London, a Liverpool, a York, a Whitby, a Bradford, a Windsor, a Hull, a Halifax, a Grimsby, a Westella, and dozens of other places which are named after places in the United Kingdom. Several consignments of goods from Canada to English ports have been stopped because the packages bore the name of a place similar to some town in the United Kingdom, without stating the country of origin in addition to the town. It need not be supposed that our Canadian cousins intend to defraud, but the law is as cruel on the Colonials who offend unwittingly as on the fraud of foreign forethought, and swoops down on both impartially. -- *Grimsby Express*.



Mr. Matheson, Havelock, Ont., will rebuild his saw mill. The shingle mill at Waubaushene, Ont., is again running. George Edwards, planing mill, London, Ont., has assigned. G. Edwards, Fordwich, Ont., planing mill operator, has assigned. Mr. Spencer, Ursa, Ont., is about to erect a saw mill on Bear Lake. G. A. Dougherty & Son, saw mill, Leamington, Ont., have dissolved. Mr. Geo Bell, Bridgeworth, Ont., is building a steam planing and lumber mill. The Selkirk, Man., planing mill is to be removed to a more desirable location. A large steam saw mill will be erected near Port Moody, B. C., by Mr. Geo. Butchart. As soon as the river breaks up the mills of Wallaceburg, Ont., will open up in full blast. Mr. C. G. Fox has got out 3,000,000 feet of logs for G. Jespersen's mill in Rodney, Ont. Mr. Geo. B. Gordon has bought the saw mill property of Mr. Angus Millan, Sunderland. Carlton Place saws at its two mills between sixty and seventy million feet of lumber a year.

There is likely to be an advance shortly in the price of lumber in the British Columbia market.

Mr. S. D. Bryan has lately purchased saw mills at Keewatin and has taken up his residence there.

The lumber camps at McKellar, Ont., are breaking up. The cut of logs this winter has been very large.

Mr. Marchildon's mill, Lafontaine, Ont., has turned out about 40,000 feet of fine oak timber this winter.

Upwards of 10,000,000 feet of lumber has been shipped from the Chemainus, B. C., saw mill since August last.

Not less than ten thousand to twelve thousand feet of lumber per day has been cut during the past season at Jordan, Ont.

The extent of lumber operations this season on the St. Croix, N. B., is about 55,000,000 feet as against 60,000,000 last year.

The capacity of G. V. Slate's shingle mill at False Creek, Vancouver, B. C., has been increased from 30,000 to 100,000 per day.

Large additions have been made to Booth's saw mills at Ottawa, and Land saws capable of cutting the largest logs have been added.

It is estimated that about one hundred and thirty-five million feet of lumber have been cut on the Upper St. John, N. B., this winter.

The saw mill belonging to the Royal City Planing Mill Co., at Vancouver, British Columbia, took fire and narrowly escaped destruction recently.

The Cootenay Valley Co. are cutting material in their saw mill for the construction of a navigable canal between the Cootenay and Columbia rivers.

The City Planing Mills Co., of Westminster, British Columbia, has imported rails from England to build a railway to the company's timber limits.

James McBride, who has been lumbering at McLean, Ont., cleared out, leaving his lumbermen without their wages, and the store keepers in great grief.

Halm's back planing and saw mill at New Hamburg, Ont., was burned to the ground on Friday, March 16th. The loss is estimated at \$15,000. Insurance \$5,000.

The Royal City planing mills, Westminster, B. C., are filling an order of spruce for the Bell Organ Co., Guelph, Ont., to be used in sounding boards in their organs and pianos.

The mills along the canal basin, Brantford, Ont., were unable to run one day last week owing to the rise in the river causing the water from the tail race to back up on the wheels.

On the morning of Sunday, March 4th, the saw, shingle and planing mill belonging to Mr. F. W. Galbraith, Bethany, Ont., was totally destroyed by fire. Loss, \$4,000; insured for \$1,000.

Some of the men who worked in Skinner & Co.'s frame factory at Gananoque before the recent strike have gone to Merrickville, the council of which village have given them a bonus of \$1,000, exemption and free rent for a time, as an inducement for them to go into the manufacturing business.

Mr. Wm Thompson, Orillia, Ont., intends having a large burner erected on the Esplanade for the disposal of sawdust and other refuse from his shingle mill.

American timber operators have been rather anxiously endeavoring to secure Canadian lumber since the recent government sale. Canadian holders very wisely seem disposed to hold on.

The Royal City Planing Mills Co., of New Westminster, B. C., to Trentsin, China, 60,000 feet of lumber, 40,000 shingles and 20,000 laths, and expect to make still larger shipments in the future.

At Thorn's saw mill at Battersea, Ont., recently, a farmer who was loading lumber in the mill yard was instantly killed by a board huddled through the roof of the mill by a circular saw alighting on his head.

Mr. Francis, of Renfrew, says that work in the firm's shanties is well advanced. They expect to take out about 320,000 feet of timber this season, 180,000 feet being from their limits on the Petewawa.

Victoria Colonist: It was rumored on the street last evening that the sale of the saw mill at Hastings, B. C., to California parties has fallen through, the proposed purchasers having failed to arrange matters satisfactorily to the sellers.

S. Fraser, of Amherstburg, and John Shaw, of Forest, closed a purchase of 12,000,000 feet of lumber and 5,000,000 pieces of lath for this season's delivery at Goderich, Point Edward, Court-right, Windsor, Amherstburg and Kingsville.

This has been one of the most active lumbering seasons Owen Sound and vicinity has ever known. The saw mills average larger stocks of logs than ever before, and the proprietors receive frequent inquiries from across the border for every variety of lumber our forests produce.

The men employed in Messrs. Gillies Bros' shanty on White Lake, recently presented Rev. Mr. Sirrell, Baptist minister at White Lake, with a handsome set of Buffalo robes, valued at \$34, as a mark of their appreciation of his kindness in ministering to their spiritual needs.

A friend writes to know if Mr. Miner's book on hammering saws gives instructions how to hammer sawyers. We think not. The only way to make a crooked sawyer do straight work is to employ a good one in his place, and pay him good living wages. -- *Southern Lumberman*.

Mr. John Irwin, of Irwin, Ont., delivered recently a monster Balm of Gilead log at the mill yard of Mr. D. H. Vanallen. It was fourteen feet in length, five feet six inches in diameter, at the larger, and five feet at the smaller end, and when measured at the mill was found to contain over 2,200 feet of lumber.

The rates on lumber per 1,000 feet from Burrard Inlet, B. C., to the ports named, are as follows: To Melbourne wharf, Australia, 50s. to 52s. 6d.; to Sydney, 40 s. to 45s.; to Adelaide, 55s. to 57s. 6d.; to Shanghai, 55s.; to west coast, South America, 37s. 6d.

Lumbermen in the country back of Ottawa say that owing to the absence of rain last fall, the small creeks are about dried up, and as there is little snow or ice in the bush to fill them, many logs will be stuck in the drive, unless there is a great deal of rain in April.

The following official list of saw mills in Manitoba and the district of Keewatin has been published:

Name of Owner or Ownes and Assignee.	Where Situated.	Capacity per 24 hours.
Boyd & Crowe	Fisher River	30,000
G. L. Brouse & Co	Bad Throat River	7,000
Brown, Rutherford & Neilson	Fisher Bay	10,000
F. T. Hulmer & Co	Keewatin	50,000
A. Cameron	Minnedosa	6,000
Dick & Banning	Keewatin	60,000
Federal Bank of Canada	Ebb and Flow Lake	20,000
Hudson's Bay Company	Riding Mountain House
Jermyn & Bolton	Minnedosa	15,000
Sigr. Johnson	Bad Throat River	12,000
Keewatin Lumbering and Manf. Co., Limited	Keewatin	120,000
J. Likely	Fort Alexander	8,000
Manitoba & Northwestern Railway Co.	Ebb and Flow Lake	4,000
Miller & Patton	Bird Tail Creek	30,000
D. McFayden	Sec. 19, Tp. 17, R. 16, W. 1st.	3,000
H. B. Mitchell	Millwood	30,000
G. Morton	Turtle Mountain	12,000
Northwest Timber Co.	Bull Head Bay	10,000
Rainy Lake Lumber Co	Rat Portage	60,000
"	Fort Francis
D. Ross	Whitemouth	10,000
S. Smith	Turtle Mountain	3,500
D. Sprague	Winnipeg	20,000
J. Stewart	Fort Ellice	3,000
A. Watts	Norquay	3,000
Wells Bros	Balmoral	2,500
Williams & Harrison	Wakopa	3,000
Whinister & Kyall	Strathclair	6,000

To whiten small articles made of brass or copper, boil them in three-quarters of a pound of cream tartar and one pound of grain tin, or any pure tin finely divided. The tin dissolves in the cream of tartar, and is precipitated on the brass or copper.

Belts conveying power are very apt to slip on pulleys, but a new pulley has been devised to prevent this. The pulley is covered with perforated sheet-iron one-sixteenth of an inch thick, which is riveted to the pulley. The tension on the belt causes it to slightly grip the holes, and thus slipping is avoided, while at the same time the pulley is strengthened.

The Geo. T. Smith Middlings Purifier Company, of Canada, (Ltd.)

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LATEST :: IMPROVED :: FLOURING :: MILL :: MACHINERY

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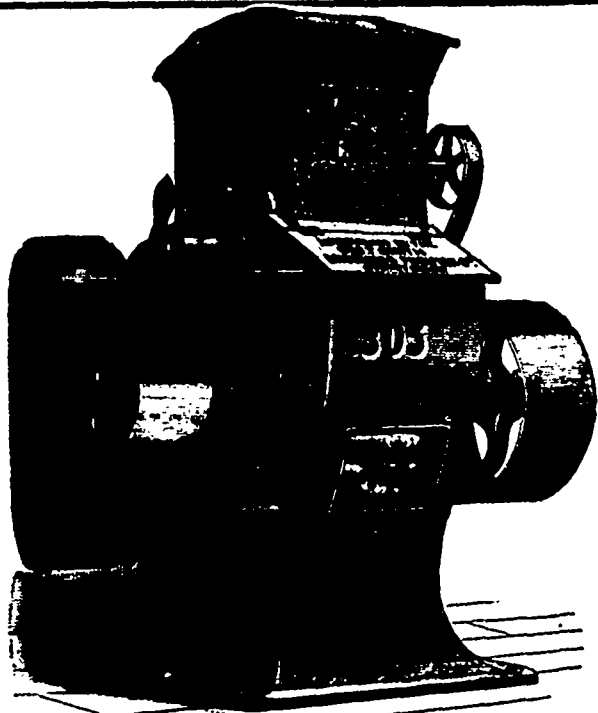
EDWARD P. ALLIS & CO'S Noiseless Belt Drive Roller Mills (

) The GEO. T. SMITH Middlings Purifier Centrifugal Reel and Inter-Elevator Bolt

And a full line of IMPROVED CLEANING MACHINERY, BRAN DUSTERS, FLOUR PACKERS, and

): **Three Roll Chop Mills** :

Full Centrifugal Mills, with either the Long or Short System, & Specialty



Lakefield, March 16th, 1888.

The GEO. T. SMITH M. P. CO., Stratford, Ont.

Gentlemen: Will you kindly give me your lowest prices for machinery, put in all complete, for a 75 barrel mill and also 125 barrel mill, similar to the two mills that you put in the machinery here in Lakefield. I might also say that our mill is running just as good as when first started. We often start at one o'clock on Monday morning and never have a stop till twelve o'clock on Saturday night, and have not had a break or any delay since we first started. I have had to refuse orders for three cars of flour this week, and have more orders now than we can fill. Any place that I have shipped flour to, I have not had a complaint. Hoping to hear from you by return of mail.

I am, yours truly,

DONALD McLEAN.

Office of McIntyre & McDonald, OXFORD MILLS, Ont., Feb. 13, 1888.

The GEO. T. SMITH M. P. CO.

Dear Sirs:—Our mill has now been in operation over four months, and we have tested her to our entire satisfaction. Instead of a 100 bbl. mill as per contract, we have a 140 bbl. mill, with yield 4 bushels and 20 lbs. to the bbl., finish and quality of flour equalled by few and surpassed by none. Our bran and shorts are the only results that are found fault with, and that is, they are too clean. Our mill is the admiration of practical millers who have had the pleasure of inspecting it in the following points: Material and workmanship employed in construction of all machinery, including millwright and iron work; arrangement of machinery in buildings; convenience, simplicity and cheapness of driving special machines; practical results; economy of operation, that is, the amount of work with so few hands. Our mill is pronounced by competent judges the model mill of Eastern Ontario.

Our Three High Chop Roll works on chop, corn and buckwheat to our entire satisfaction, in capacity, results and economy. It is a daisy.

Yours truly,

MCINTYRE & McDONALD

Montreal, Feb. 18th, 1888

Messrs. GEO. T. SMITH M. P. CO., Stratford, Ont.

Gentlemen,—The Feed Roll we bought of you some time ago has worked so far to our entire satisfaction. It has a large capacity, does its work well, and does not get out of order, and is the best machine in the market for grinding feed.

Yours truly,

A. W. OGILVIE & CO.,

Per P. M. Clark, Head Miller.

OXFORD MILLS, February 13th, 1888.

GEO. T. SMITH M. P. CO.

DEAR SIR,—I have the honor of being Head Miller in the Oxford Roller Mills. I consider it a first-class mill in every particular, easy to manage, light to run. The results cannot easily be beaten: Our yield less than 4½ bushels, our straight grade equal to many patents, our low grade good, bran and shorts extra clean. Take it all in all it is the best and easiest managed 100 bbl. mill I ever operated or saw. The Chop Mill I think is faultless in its work.

Yours, etc.,

R. D. GARDINER, Head Miller.

It will pay you to visit some of our full CENTRIFUGAL MILLS and compare results with mills built upon other systems.

ALL ENQUIRIES WILL RECEIVE CAREFUL ATTENTION.

ROLLS RE-GROUND AND RE-CORRUGATED AT SHORT NOTICE.

THE GEO. T. SMITH MIDLINGS PURIFIER COMPANY, OF CANADA, (LTD.)

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CHAS. M. WHITLAW, Manager,

COMPLETE STOCK OF

Leather Belting, Lace Leather,
Gummers, Cutters, Saw Sets,
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Wheels, Swages and Files,
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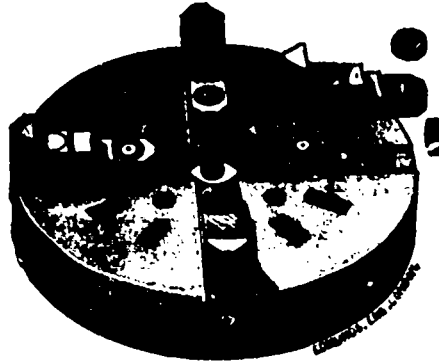
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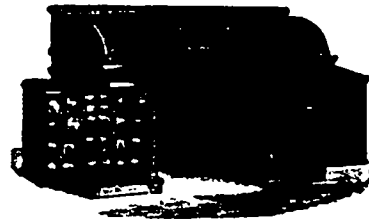
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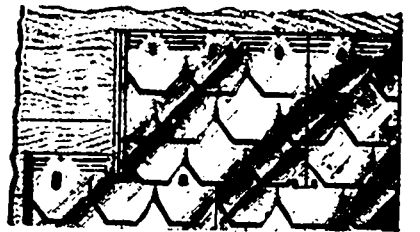
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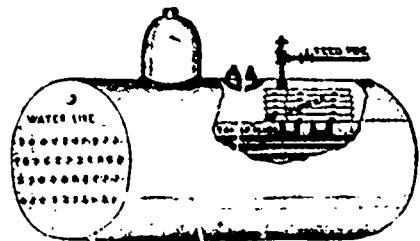
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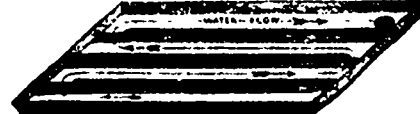
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FOR CIRCULARS WITH REFERENCES, PARTICULARS AND PRICES, ADDRESS

No Purger Used!
Heat alone does it!

THIS PURIFIER ENTIRELY PREVENTS
THE FORMATION OF SCALE UPON SHELL
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IS USED. ALL IMPURITIES ARE EXTRACTED
FROM THE WATER BEFORE IT REACHES
THE WATER LINE, AND ARE DEPOSITED
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THESE PANS CAN BE REMOVED, CLEANED
AND REPLACED WITH VERY LITTLE TROUBLE,
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EMPTYING THE BOILER OF HOT WATER,
WHICH MEANS A SAVING OF TIME,
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Some Pertinent Suggestions!

FIRST { We tan our Leather especially for Belting.
We have increased our trade threefold during the last few years.
We sell our Belting according to a list that is 25 to 30 per cent. lower than the American list which some sell by in Canada.

BUT { We have heard some consumers who are N. P. manufacturers say that they cannot get good Belting made in Canada.

NOW { **WE HAVE CUSTOMERS** { To whom we have sold from \$3,000 to \$10,000 worth of Belting,
—AMONG THE— { One firm alone buying from us last year to the amount of \$10,000 for their Mill.
BEST MILLS IN CANADA

CAN YOU { Harmonize these Facts with any other theory than { 1st. That our PRICES are RIGHT?
2nd. That our LEATHER is GOOD?
3rd. That our BELTS are WELL MADE?

IF NOT { Send us a sample order and see if we cannot please you.

ROBIN & SADLER,

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