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THE DOMINION MECHANICAL & MILLING NEWS

DEVOTED ESPECIALLY TO THE INTERESTS OF OWNERS AND OPERATORS OF

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

Vol. XI—No. 1.

TORONTO, ONTARIO, JULY, 1888.

{ Price, 10 Cents.
\$1.00 PER YEAR.

COMBINED PLANER, MATCHER AND MOULDER.

WITH quite a number of small manufacturers in wood working establishments and saw mills, economy in room, and machinery of such construction as will not only plane lumber, but match and make mouldings, wainscoting and other forms of material seems to be sought after of late years, hence the production of the machine which we illustrate on this page. This machine appears to fill all these specifications. The main cylinder, which is made of forged steel, carries plain knives on two sides, and is slotted on the other two sides for moulding, beading or siding knives. Genuine Shimer matching heads are used for matching, and also a set of 4-sided slotted heads for moulding.

The machine is convenient in construction, easily operated, and appears to be just the thing for small mills that have not room and cannot afford the expense of three or four machines to do such work as this one machine is designed to perform.

A. R. Williams, Soho Machine Works, Toronto, is the manufacturer, from whom any further particulars may be obtained.

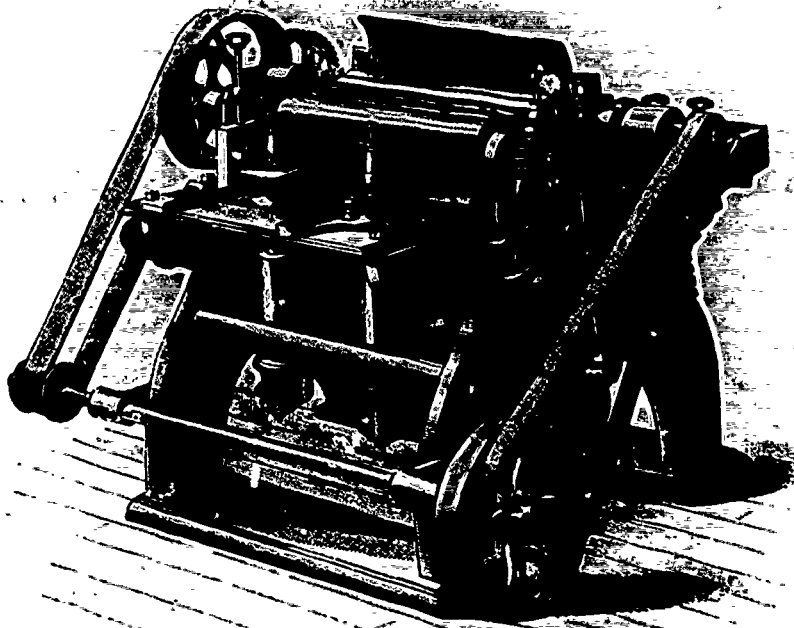
WHY MANY FLOUR MILLS FAIL.

COMMENTING on the reasons why many flouring mills fail, the *Milling Sphere* says: "There are more mill failures to-day on account of the use of inferior cloths employed in their clothing than from any other single cause. We have known firms to construct mills perfect in every appointment up to a certain point to equip them with first class operatives and launch them in the trade with apparently every advantage furnished to full measure, and then defeat the whole business by the employment of inferior cloths, the same not being found out until the firm was badly crippled by losses. We were once sent to find out the trouble in a mill where settlement was being postponed between builder and owner because the break flour was not right. Two experts had visited the mill at different times before and were defeated; and we fully expected to have the same kind of medicine to swallow. But through accident, perhaps, we discovered that a strip of flour-cloth, filling between two ribs, among the break-flour reels, was a miserable abortion. The branded number of this was a 14, but it abounded in meshes running as far down as a 9. Time and again we have known millers to condemn a centrifugal reel when the fault was not in the reel but in the manner in which they had clothed it. They had bought without clothing, intending to employ the same graded numbers as they had seen a neighbor use in the same position in his mill. But in buying they had failed to secure a cloth of equal reliability to that of their neighbor, according to its branded numbers. Hence the work of the machine was a failure and accordingly unjustly condemned."

Our Manitowish correspondent touches upon a feature of trade not commonly noticed in the lumber journals—the foreign demand which comes through Canadian sources. He speaks of a call for "longitudinals," an item not frequently discussed, but an important article in the list of materials used for railway building in England, where the bed work of the road is often of solid masonry; and the necessity exists for something that will "give," on which to fasten the rail. The longitudinal lays on the stone work, averages about 32 to 34 feet in length, in dimension 5 1/2 by 3 1/2, and has to be clear stuff—good lumber.—*The Timberman*.

Western Letter.

THE great matter of interest to all classes of our people out here in the Great West—we don't like the term Northwest, it sounds too cold—is the crops. There is no part of the country which depends so largely upon the crops as this prairie region. In this new country manufacturing and other industries, aside from those depending upon agriculture, have not made much progress as yet. The milling industry, the only manufacturing branch which has been developed to any extent, depends entirely upon the crops. Everybody and everything relies upon the crops, and hence the crop



COMBINED PLANER, MATCHER AND MOULDER.

situation is watched with an intensity of interest which is quite unknown in the east, and in older countries where the pursuits of life are more diversified. When the crop outlook is poor, a sense of depression pervades the land. The people are gloomy, and will not undertake new business enterprises. Merchants will not buy goods, and the unlucky drummer who goes on the road at a time when the crop outlook is unsatisfactory will return with a blank order book. "How is it," remarked a Toronto drummer to me a short time ago, when the crop outlook was not good, "that you hear so much about crops in this country. I have been up here for a fortnight, and I haven't heard anything talked but crops. People won't buy goods because the crops are not favorable, and if I am going to do any business, I will have to sit right down in the hotel here and wait for a change in the crops. If the crops in Ontario are a total wreck you would not hear half as much said about it." Thus spoke this eastern drummer, and such is really the case. The feeling is, that notwithstanding the good crops in the past, the country is still on trial. Aside from the direct advantages arising from a good crop, many people here seem to imagine that the whole world is watching Manitoba crop reports, and that a good crop will bring us plenty of immigrants to develop the country, while a poor crop will have the opposite effect.

The crop outlook this season has been a varied one. It has been both one of the most unfavorable on record, and also one of the most favorable. To commence with, the very heavy crop of last year put farmers greatly behind with their fall work. This, followed by an

early winter, closed last year's farming operations with plowing considerably behind. Now, in this country fall plowing is looked upon as essential to successful farming. On account of this backward condition of plowing, people hoped anxiously for an early spring, so as to make up for the loss of time last fall. But instead of an early spring, 1888 has been one of the very latest on record. Winter held on with surprising tenacity, and weeks after farming operations had been in progress last year, this year the prairie was still covered with its white mantle of snow. At last, however, the snow slowly disappeared and the farmers got to work. The seed was put in the ground in excellent condition, the weather being exceptionally favorable for seeding, but it was too cold for growth, and if it had been warmer, it would not have been any better, as there was no rain to start growth. Weeks stole away and there was no change. The weather was cold and with sharp frosts at night, and owing to the drought, the grain that was commencing to show above ground was only patches. The feeling of hope had changed to one of restless impatience, and this again was giving place to one of settled despair. Everybody who had a stake in the country had the blues, and there was a feeling of depression abroad, which even the removal of railway monopoly and the building of the Red River Valley railway could not relieve. But in the nick of time the change came. June brought with its first day a decided change in the temperature, followed a day or two later by copious and warm rains. Such a month for vegetation as this June has been, is perfectly surprising. Warm, drizzling rains at frequent intervals, with the long hours of sunshine for which this country is famous, have wrought such a change as can hardly be imagined. The result is that notwithstanding the gloomy prospects throughout May, July will commence with one of the

most favorable crop outlooks in the modern history of the West. The crop will be as far advanced as is usually the case on that date, and the copious rain that is falling at the time of writing, practically disposes of any serious danger from drought for this season. Before the effect of drought could be felt the crops will be too far ahead to receive much injury. Old settlers are delighted, and declare that this has been a typical Manitoba spring, such as used to prevail up to recent years, but have been lacking since 1882. In justice to these old settlers it must be said, that all along they contended that things would turn out all right, notwithstanding the backward weather. Their idea is that when the spring sets in early, the crops are more liable to suffer from drought during the early part of the season, and do not make as rapid headway as when the season is later. The favorable crop conditions prevailing at the time of writing, are not confined to Manitoba. The same report is true of the whole country, from the Lake of the Woods to the Rocky Mountains, and northward to the great Saskatchewan river. Telegraphic advices report that the rain falling at the time of writing is general all over the country. Even the region generally considered as the dry district, is receiving a thorough soaking. The grass is excellent, and where grain has been sown, it is doing remarkably well. The crop outlook for the entire west is therefore most hopeful, and with a continuation of favorable weather, this country will maintain if not eclipse its record of last year.

As to the area sown to the respective crops this season, it is very difficult to give even an approximate esti-

mate. No systematic attempt has been made to arrive at any conclusion in this direction, and such statements as have been made are merely the opinions of individuals, many of whom have very little knowledge of the situation, and are not competent to give a reliable estimate. Some statements sent out are certainly wide of the mark. For instance an "Ontario Miller" writes to the *Miller*, of London, England, stating that there will be an increase in the wheat area of thirty per cent. Where "Ontario Miller" got his information I do not know, but it is pretty certain that he is far over the real increase. Circumstances have conspired to prevent a large increase in the wheat area this season, the cause being, as previously noted, the backward state of fall plowing last fall, and the late spring this year. It is the custom here, as a rule, to sow wheat only on fall plowing, and as fall plowing was backward, it is evident that the increase in the wheat acreage could not be very great. There will be a considerable increase in the acreage of all grains this year, but principally in oats and barley. The increase in the wheat acreage in 1887, as compared with 1886, was placed by the Manitoba Agricultural Department at slightly over ten per cent. Now, in 1887 there was a falling off in the acreage of both oats and barley, on account of the low prices for these grains in 1886, consequently the wheat acreage was increased at the expense of these coarse cereals. This year it is generally admitted by those in a position to judge, that the area of oats and barley will be very largely increased, hence a large increase in the wheat area cannot be expected. We have therefore two good reasons for believing that the wheat area will not be anything like thirty per cent. greater than last year, nor even half that. Ten per cent. is probably the maximum. Last year the wheat area in Manitoba alone was placed at 432,134 acres, and these figures were probably within rather than in excess of the real acreage. The wheat area in Manitoba for 1888 may therefore safely be placed at 450,000 acres. In the territories there will probably be a slight increase in wheat, but nothing to signify, as the area sown to barley has been greatly increased.

In coarse grains, particularly barley, the area in Manitoba and the Territories will be much greater than in 1887. Spring plowing is usually devoted to coarse grains, and as there was more spring plowing done this year than last, the reports of large increases in the acreage of coarse grains look remarkable. A great deal of land has been devoted to barley, for two reasons, namely, the very late season this spring, and the favor with which Manitoba barley was received last winter. On account of the very late spring farmers hustled their wheat in as soon as possible on their fall plowing, and then got what barley they could in on spring plowing, as this grain matures in this climate in a remarkably short time, and is therefore not in danger of damage from frost, even when sown late. About 60,000 acres were devoted to barley in Manitoba last year, and some samples of the grain forwarded to malsters in the United States, were highly recommended. This was followed by the arrival of buyers, and shipments were made direct to points in the States. The Winnipeg Board of Trade issued a circular calling the attention of farmers to the advantages of growing some barley, instead of so much wheat, and this no doubt had some influence in increasing the area sown. In some districts the increase in the barley area is placed at 50 per cent. over last year, but the total area for the Province will be from 80,000 to 108,000 acres. The area sown to oats last year was slightly over 155,000 acres, and this will be increased considerably, though to what extent it is difficult to say.

Next to the crops, the most important matter under consideration here is the proposed changes in the grain standards. This is a matter which has attracted keen interest here, and upon which we westerners are wont to look with a feeling of jealousy. There is certainly a feeling of resentment against any interference in the matter by eastern grain men and millers. Manitobans think they know what is best for their own interests, and they further think that they should have full control over the grades of wheat grown only west of the Lake of the Woods. They say, let Eastern people grade their own wheat as they choose, but let them not interfere with Manitoba grades. The action of the Toronto and Montreal Boards of Trade in petitioning the Government at Ottawa in opposition to the wishes of western people regarding the wheat grades, is therefore causing a decided feeling here of resentment. Still, looking at the question fairly, the voice of eastern grain men and millers is worthy of some consideration. Many of them are dealing largely in Manitoba grain, and their opinions should carry some weight. Though the Winnipeg Board of Trade was the first to move in the matter of requiring

a change in the wheat grades, yet the question is looked upon here as mainly a farmer's matter. The local grain men have asked for the change, not so much in the interest of the wholesale grain trade as in the interest of the farmers and the country at large. So far as the local grain dealers are concerned it would matter but little whether the grades are kept up to the present high standard or not. Indeed, it would seem that it would be an advantage to the dealers to have the standard as high as possible. Still the dealers are willing, in justice to the wheat producers, to have the standard lowered, and with the unanimous opinion in the west that the grades should be reduced, the Government should accept the proposals put forth by the Western Boards of Trade. The bulk of the Manitoba wheat crop of 1887 has graded No. 1 northern, while Duluth gets a much larger proportion of No. 1 hard than Winnipeg. The difference is not in the quality of the wheat, but in the grades. With the same grades in force here as at Duluth, Winnipeg would get more hard wheat, proportionately, than Duluth. Now, it has been found that Manitoba hard and Duluth hard brings about the same price, and though there is a difference in quality in favor of Manitoba, yet buyers will not make a difference in the price. No. 1 hard is No. 1 hard, whether it is inspected at Duluth or Winnipeg. Manitoba wheat is always valued here at Duluth prices, but at the same time wheat which would grade No. 1 hard at Duluth, will only grade Northern here, thus practically a great deal of our crop is sold at two cents under Duluth. As Duluth is our natural competitor, it would seem but reasonable to have the grades here more in keeping with the quality there. Before another crop commences to move the Northern Pacific railway will have a road running into Manitoba, and as the road will be operated in connection with the Manitoba Northwestern railway, the Northern Pacific will have control of a line running the entire length of the Province, and some miles beyond into the Territories. This will give direct connection with Duluth, and will allow of shipping wheat to that point. In case the Manitoba grades are kept up to the present high standard it may be expected that considerable Manitoba wheat will go to Duluth for grading, where advantage can be taken of the lower standard in force.

LOGGING BY RAILROAD.

THE past winter and spring has more effectually than ever before demonstrated the superiority of logging by railroad over the old process of depending on the elements to get the crop of logs of the mill booms. As the steam mill, and circular, and gang and band saws have superseded the old water power, and mule saw, and the steam railroad superseded the old stage coach, so is the steam logging railroad gradually but surely superseding the slow tedious and ancient process of banking, breaking rollways, driving, booming and towing logs, besides being dependent on the elements to furnish sufficient *agua pura* to float them to their destination, to say nothing of the attendant loss through the devious methods that only a lumberman understands, and very often an entire loss of capital invested for a whole year through the "hung up" process. The railroad logging process takes the logs from the skidways in the pineries, and drops them surely and safely in the mill boom in a few days after the logs have been skidded, if necessary, without the loss of a single log. As the steamboat is superior in every respect to the old sail vessel, being enabled to push forward to its desired destination with precision and accuracy, so the steam logging road being independent of wind and weather, or floods or drouth, is now recognized as the only method which is safe for a lumberman to tie to. Of course the modern method involves the possession of extensive capital and will gradually result in driving out smaller operators and extending the crop of lumber barons, but this is the result of the natural laws of trade and business. The sawmill industry itself has passed through all the stages of advancement, until a mill man must at the present day necessarily possess great capital as a preliminary to success. The same law has brought about results also in the pine land business, and every year places the timber lands of the country in fewer hands. It is the law of concentration which almost imperceptibly, but surely creeps into the important industries with the concentration of population and business, and hence the rich becomes richer and the poor poorer, notwithstanding the warning voice of the demagogue agitators who present finely spun theories to prevent inevitable results; but never apply them as individuals. The age of improvement and advancement has been reached in the logging business as well as in the mill industry and every other department of lumber, as natural results of American genius, tact and enter-

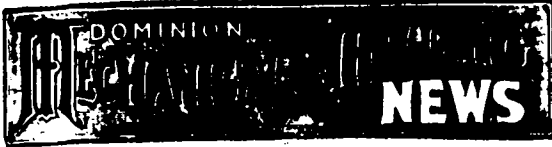
prise. As illustrative of the drift of the business to "big things," the operations of the J. E. Potts Salt and Lumber Company in Oscoda county, Michigan, may be cited, the company actually banking half a million feet of logs daily on their logging road. It requires master minds to conduct such business and immense capital to handle it, and it is a source of benefit to hundreds of employes as well as to the firm furnishing the capital and brains.—*The Timberman*.

TRAINED MECHANICS.

OUR schools, public and otherwise, are apparently constructed on the idea that all who are to attend will in the end be professional men, merchants or clerks. Mechanics are neglected. Most of the knowledge in a mechanical line to-day is of a pick-up nature. We do not mean to say that a boy could be taught to be a miller, baker, machinist, blacksmith or carpenter in our schools, neither is he taught to be a lawyer, a dry goods clerk, or a merchant of any kind. He might be taught as to the general principles of one thing as well as the other. There is an over-supply of clerks, lawyers and doctors, for the reason that all of our schools and colleges have been constructed on the idea that the chief end of man is to occupy a professional position. The result is the over-supply and the stop-over of disgusted clerks and men who have to take anything which is offered and for which they are not particularly fitted. The clerks are, for the most part, fairly well educated men. They are better educated than are the carpenters, builders and mechanics in general. There is no reason why this should be true. The mechanics mentioned have quite as much use for an education as has the clerk. The process of education in the school does not make carpenters or millers or other mechanics. It is exactly the other way; it leads in the other direction. If he goes to school, if he does not study a profession possibly he becomes a book-keeper, or is led into some kind of office or store work. But rarely, if ever, is he especially led into mechanical pursuits. If he gets into that way it is incidental; it is not the result of his training. The unhappiest of men are those who are led into pursuits for which they are not fitted, or if into these for which they are fitted by nature they are not properly educated for the higher walks of that pursuit. An education should be for the purpose of helping one to do that for which he is best suited. In the end this means happiness and contentment. This does not necessarily mean that all should be educated to take high positions in the various branches of work but to take whatever position properly belongs to them—a position which is natural to them. Nothing more or nothing less. An Indian who would receive the education of a divinity student, if that thing were possible, would be an unhappy Indian. He would be worthless as an Indian, and as well worthless in the direction in which he had been educated. He would be thrown out of his world. The man whose education leads him into something for which he is not fitted lives the life of discontent. It is probable that he may have to take up something for which he is the least fitted simply from force of circumstances. If he is educated as a business man and is not suited to business pursuits, he must take the most menial and unsatisfactory department in business life. Now it may be that this same man would have made a most excellent mechanic, and would have lived happy as such, but the public school system does not make mechanics, does not lead them in that direction. It leads them away from it. In this respect the system is wrong. It is rare, indeed, that we hear of a young man in school who is studying to be a miller or a mechanic. It is only too common to know that they are studying to be lawyers, doctors and preachers. Of these we have an abundant over-supply.—*The Millstone*.

PRIZE STUDIES OF TORNADOS.

THE *American Meteorological Journal*, desiring to direct the attention of students to tornadoes, in hopes that valuable results may be obtained, offers the following prizes: For the best original essay on tornadoes or description of a tornado, \$200. For the second best, \$50. And among those worthy of special mention \$50 will be divided. The essay must be sent to either of the editors, Professor Harrington, Astronomical Observatory, Ann Arbor, Michigan, or A. Lawrence Rotch, Blue Hill Meteorological Observatory, Readville, Mass., U. S. A., before the first day of July, 1889. They must be signed by a *nom de plume*, and be accompanied by a sealed envelope addressed with same *nom de plume* and enclosing the real name and address of the author. Three independent and capable judges will be selected to award the prizes; and the papers receiving them will be the property of the Journal offering the prizes. A circular giving fuller details can be obtained by application to Professor Harrington.



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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.

OUR EXHIBITION NUMBER FOR 1888.

THE success which attended the publication of a special Exhibition Number of the MECHANICAL AND MILLING NEWS last year, has encouraged us to make another effort in the same direction. On the first of September next we shall publish our special Exhibition Number for 1888. Preparations to that end have already commenced. The cover design is by one of our most clever Canadian artists, and when printed in three colors, gives a most pleasing effect. Printed specimens of this design are now in the hands of our travelling representatives, and the manufacturing public will be invited to pass judgment upon them. Many new and interesting features are intended to grace and give interest to every page of this number. Some of these will be mentioned more particularly later on. Not only is it our purpose to make this Exhibition Number very much superior in every way to the one published last year, but the edition printed is guaranteed to number not less than 20,000 copies. The greater part of this enormous edition will be mailed to owners and operators of flour mills, saw mills, planing mills and iron-working establishments throughout every part of Canada. The balance will be carefully circulated among manufacturers in the above lines who may exhibit at or visit the Toronto, Hamilton, London and other large Exhibitions throughout the Dominion. We do not hesitate to say that this special edition will afford manufacturers of machinery, etc., the best opportunity they could possibly have of directing the attention of machinery users to the special advantages of their goods. We shall be pleased to send card of advertising rates and all information to manufacturers desiring to be represented in this special number. Those who apply early will have the choice of position. Come one, come all.

AT Bay City, Mich., a lumbering firm is employing young women to pack shingles, and so satisfactory is the result, that the displacement of men by women in this field of labor is confidently predicted.

THE Canadian mineral exhibit has just been shipped to the Cincinnati Exhibition. It will occupy a space of 1,400 feet, and will doubtless lead to the investment of American capital in Canadian mines.

AN English inventor has recently patented in Canada what he describes as an "apparatus for checking the receipt of money." Every business man will agree with us when we say that we have no use for such an invention in Canada. What most people want over here is an apparatus that will facilitate the receipt of money.

A CORRESPONDENT who is engaged in the erection of flour mills writes to the MECHANICAL AND MILLING NEWS to enquire whether we can put him in the way of buying a good practical book on mill-wrighting. As we do not know where such a book might be obtained, we would feel obliged if any reader will furnish us with the desired information.

REPORTS reach us of the destruction of much valuable timber by forest fires in different parts of the Dominion. If the balance of the season should continue as dry as the last three months, the loss through forest fires will probably exceed the record of past years. The "camper-out" and the tramp have much to answer for in connection with the origin of these fires.

THE indications are that the grain crop in the Northwest the present year will be quite as abundant as that of 1887. This will boom the country as a field for emigration. We regret that the crop prospects in Ontario are not of a more encouraging character. We need a plentiful harvest in the east as well as in the west to make good the deficiency of last year, and put the business of the country on a more satisfactory footing. We still live in hopes that this result may in a measure, if not fully, be achieved.

THE amendments to the Grain Inspection Act recently decided upon by the Government will go into effect at the commencement of the new crop year. Winnipeg journals state that the new regulations are the cause of great satisfaction to Western dealers. Eastern men would probably prefer to see a higher standard maintained, but as due notice of the proposed changes has been given, there will be no disturbance of business such as must have followed the changes suddenly inaugurated a few months ago, and no very decided objections are likely to be made to the changes now proposed.

THE following paragraphs, clipped from a Northwest local paper and a Montreal daily paper respectively, tend to show that our Canadian Northwest has important advantages to offer the settler as compared with Dakota: "Mr. G. Martin, a Canadian who settled five years ago in Dakota, has bought a farm here and intends settling down once more on British soil. He found farming a failure in Dakota after a good fair trial. He appears to know what's what." * "A number of Canadian settlers in Dakota have purchased farms in Southern Manitoba. High taxes, exorbitant railway freights and cyclones in Dakota have driven them to the Prairie Provinces."

EX-GOVERNOR ALGER, the millionaire lumberman, of Michigan, whose name has been mentioned in connection with the Republican nomination for the Presidency, being asked what effect in his opinion the lumber tariff has on prices in the market, replied: "The tariff on lumber from outside of the United States is \$2 per 1,000 feet. There is probably no product the price of which would be less affected by removing the tariff than lumber. The only difference would be, if we crossed into Canada to cut our lumber, where we have just as good shipping facilities through the lakes as we have in Upper Michigan, that we would not employ the labor in our State, and at the same time we would be paying in Canada fixed charges quite equal to the American lumber tariff. The Canadians have been wiser than we in their system of controlling the lumber lands. In the United States you can buy the pineries for \$1.25 an acre, unless you get them from the railroad companies, when you pay \$2.50. But in Canada the government has reserved its lumber land, and you there pay \$1 per 1,000 feet direct tax to the state. Then you must pay on every ten acres a rental of \$2 a year.

Hence the lumber would cost as much if it were cut in Canada as in America by the time it reached the American consumer. Here you pay to your own people the excessive portion of the price of the lumber, which is the labor. I prefer to do that, and therefore I have gone into California and Oregon and acquired lumber lands.

THE *Milling World*, of Buffalo, has of late been zealously engaged in depreciating Canada and everything Canadian while exalting the United States, with the object of preventing immigration to this country and directing it to Dakota and other parts of the Union. In reply to one of its articles we pointed out last month that although Canadians do not live as fast as the people of the United States, it remained to be proved that fast living resulted in the greatest comfort and happiness. Our contemporary in replying to our remarks doesn't attempt to prove this, but contents itself with the lame assertion that "fast" life in the Western States seems to secure the greatest comfort and happiness. It is well to remember that things are not always what they seem. We further said: "We are able to offer the immigrant to the Northwest the most productive soil in the world, immunity from floods and tornadoes and just laws properly administered. We can not imagine what more he should require, nor do we believe in the States here he could receive privileges as great." In reply to this our contemporary wants to know whether we control the elements by means of a "Patent Canuck Cloud Controlling Contraption and Tornado Tier," and that if we do, Dakota would give us millions for our invention. There isn't the least doubt that Dakota is in great need of such an invention, and would be willing to pay a high price for it. If we had one, we wouldn't mind selling it at a reasonable figure, as we would have no use for it in Canada. We don't have either floods or cyclones worth mentioning in this fair land, therefore we are able to guarantee the immigrant immunity from them. It is reasonable to suppose that at this late day the elements will not be less kind to us than they have been for hundreds of years past. Our contemporary's reference to Canada as a "vassal country" is highly amusing. We have all the liberty we require to do right, though possibly the transgressor finds his way a little harder over here than across the lines.

THE convention held at Buffalo last month under the management of the Millers' National Association of the United States, was an important one. The result of its deliberations must prove beneficial to the milling interest on the other side of the line. The Millers' National Association, which has been severely criticized and ridiculed by a majority of the milling papers for its inertness, has evidently profited thereby, and now shows that it is still alive and ambitious to accomplish some of the objects expected of it. Interesting discussions took place at the convention on abuses which tend to make milling unprofitable. Chief among these appear to be unjust discrimination in freight rates as between wheat and flour; burdensome clauses recently added by the London steamship companies to their bills of lading, by which 1s 6d additional quay charges must be paid by the flour exporter; the loss resulting from the practice of making consignments of flour to brokers instead of selling only direct to purchasers. For the purpose of having these and other obstacles in the way of profitable flour milling removed, the convention decided upon establishing at Chicago a central office, with a competent, well-paid man at its head, to act on behalf of the Association. The idea seems to be a good one, and if the right man is appointed as manager, the central office will, we are convinced, be worth many times its cost to the millers who will be assessed for its support. A committee was appointed to prepare a memorial to Congress to endeavor to secure a modification of the policy of the Brazilian Government in the matter of the proposed British-Brazilian flour mills. A continuance of the present policy would, it was said, have a ruinous effect upon the extensive flour export trade from the United States to Brazil. We confess we read this statement with considerable surprise, as the *Milling World* recently pooh poohed the idea that the American manufacturer and exporter of flour had anything to fear from the action of the British capitalists who were to build the large Rio Janeiro mills. The convention discussed in a very animated way the crop prospects for the present year, and despite the evident desire of the millers to put the brightest face possible upon the situation, the reports of delegates from nearly every part of the Union went to show that the growing crop is likely to be far short of a good one, averaging probably not more than 60 to 75 per cent. of a full harvest.

A GREAT deal of carelessness is shown in the shipment of machinery by rail. The writer noticed a few days ago a lot of valuable non-working tools lying on a side track on an open flat car, and covered with rust from exposure to several showers of rain. It would require many days if not weeks of hard work to put this machinery in condition for work, and the purchaser will certainly prove himself to be an easy-going individual if he does not insist upon receiving a substantial rebate for the injury caused by careless shippers.

We direct the attention of millers to the advertisement of Messrs. Runciman Bros., which appears on another page of this paper. They announce that they have made arrangements to manufacture the Hurford flour bolt, a machine which is widely known and well thought of by the millers of the United States. Messrs. Runciman Bros. are also agents for the new Cochrane roller mill, and are prepared to undertake the building of new mills and the refitting of old ones. They have opened an office at 20 and 22 Main street east, Hamilton, and millers are invited to correspond with them.

It is very saddening to hear, as we frequently do, that some old time business man who years ago made money and was well to do, has in later years been losing ground, and is now in old age forced to make an assignment of his estate to satisfy the demands of his creditors. The ranks of the mill men and manufacturers furnish quite a number of such cases. The unfortunate individuals who have thus been reduced from affluence to poverty, can in many instances trace their misfortune to the changed conditions brought about by the march of time and improvement. There was a period in the history of this country when almost the only thing necessary to make money was to be industrious. There was no competition to speak of, and therefore no great amount of thinking was necessary in the direction of adopting new devices to cheapen production or new methods of disposing of the articles produced in order to secure the advantage over business rivals. It was during this period that the old timers of the present day made their money. The conditions under which they achieved success, however, have for years past been rapidly changing, until to-day the change is complete. Business is now conducted under entirely different circumstances and by different methods. Many of the old time mill men and manufacturers, having built up a profitable business and a substantial bank account, felt themselves secure, and refused to abandon the system under which they had been working for so many years in favor of any of the "new-fangled notions" and devices of younger men. As competition waxed fiercer, prices were beaten down, and profits reduced. The men who adhered to old-time methods suffered most severely from this cutting down of profits, because the cost of production in their case was greater, and the margin of profit consequently less. Still they refused either to adopt new methods or to retire from the race. Profits continued to dwindle, younger and more active competitors gradually succeeded in underselling them and taking away their trade. They began to draw upon the accumulations of former years in the hope of maintaining the fight and perhaps of regaining lost ground. Only when their savings had slipped through their fingers could they be convinced that it was impossible to achieve either of these results. The *finale*, as we said at the beginning, is a touching one. There are many old-time business men whose career has thus sadly ended, who might have finished their days in comfort if they had either retired from business when it became apparent that new circumstances had arisen requiring new methods, or has at once determined to keep abreast of the times.

VALUABLE AND CHEAP.

NICOLA LAKE, B.C., JUNE 18, 1888.

Editor Mechanical and Milling News:

DEAR SIR, Enclosed please find one dollar, for which continue to my address the DOMINION MECHANICAL AND MILLING NEWS. I think that it is one of the cheapest papers printed, and one which every mechanic should enjoy.

Very truly yours,

EDWIN CARSWELL.

Prices of lumber range very high in Australia. At Sydney the native lumber is reported to sell—native cedar, from \$60 to \$80 a thousand; pine of various kinds from \$50 to \$60, blackbutt hard, and a species of eucalyptus, from \$30 to \$40. There is a 24-cent duty per hundred feet in New South Wales, and a higher one in the other colonies. There are said to be about seventy new mills in the timber belt along the coast from southern New South Wales to northern Queensland.

SHORT BREAK MILLING, BOLTING SYSTEMS AND REELS.

THE following valuable paper on the above subject was read at the recent Millers' Convention at Buffalo, by Mr. J. M. Case, of Columbus, Ohio, and should prove interesting and instructive to Canadian millers:

We desire to present in this paper, in as concise a manner as possible, our views of the shortest system practicable and the least number of machines requisite for small mills to change to the full roller system, enabling them to produce a straight grade of flour that will give good satisfaction for local and exchange trade. Also to present what we think is requisite for a most complete three-break 100-barrel mill.

And further, to make some comparative statements as to the merits of the two prominent systems of bolting—the "round reel" and the "centrifugal system."

In doing this it will be necessary for us to refer to the mechanical action of such system, and to draw such conclusions therefrom as facts will justify; and if our position should seem to antagonize that taken by other prominent manufacturers, it is not because we would desire thus to do, but rather because we wish to present what we believe to be the truth and to give our reasons therefor.

The science of bolting is the most difficult and intricate problem connected with modern milling. The conditions under which separations have to be made are so varied; the evils arising from even a seemingly small imperfection are so marked, and the varied temperatures and varieties of wheat have such an influence upon general results that we may safely say that but few men, if any, have reached that position that their judgment can be relied upon to formulate the best system of separation, adapted to every locality and condition.

We may, however, present four general rules, with which, if followed minutely, the results cannot be far from right.

First: Return no material back into or in advance of the reel from which it was taken.

Second: Never permit granular stock to reach the tail of the mill.

Third: Throw off branny and fibrous material and deliver the same to the tailings roll at every point possible.

Fourth: Increase the bolting and dusting capacity as you enter the warm climate of soft wheat sections.

The first rule prevents accumulation and keeps the stock pure.

The second reduces the percentage of low grade and insures a good finish. The failure to follow this rule is costing the millers of this country and Europe an inestimable loss, and is the key note to many failures.

The third relieves the bolt of impure material and increases the capacity.

The fourth nearly all the mill builders have learned from individual experience, and it should be borne well in mind.

These conditions can not be carried out with a limited number of reels. We have shown in one of the accompanying programmes of a one hundred barrel mill all these conditions, but in the program for a small mill, figure 1, we have not a sufficiency of reels, yet the stock is so handled that a very excellent straight grade of flour can be made; a flour that will give general satisfaction to the local and custom trade and also, make a very good finish.

The outfit, as you will observe from the program, consists of three stands of four roller mills, two pairs corrugated and four pairs smooth, two scalping reels, four bolting reels and one purifier. The system of separation as it will be seen, is calculated to throw off impure and branny stock from the tail of each flouring reel, the amount thus discharged being under the control of the miller, by the use of the double conveyors reversed at the tail. This system gives the miller perfect control of the mill, under the varying temperatures and conditions of wheat, and enables him to prevent the accumulation of woody fibre at the tail of the mill, whereby the rolls are often held apart and prevented grinding the finer stock, and which also causes the rolls to run hot. And inasmuch as the tail of the mill generally measures the capacity, this system also increases the output. It can be made more perfect by adding a bran duster to handle the tailings stocks, the material from which should be dressed on a small centrifugal reel. But I have given this outline of machines and bolts, as the limit necessary to profitable milling and the addition of a bran duster and centrifugal would simply take from the finished feed a small percentage of low grade flour.

In reference to a first break machine calculated to split the berry and relieve what is termed the "seam

dirty," if the wheat is not well cleaned and polished this machine will prove a good wheat cleaner, as the rubbing and jarring action of the break machine and the scouring action of the scalper will remove much of the adhering bran scales. If, however, the wheat is thoroughly cleaned and polished, the advantages, if any, will not be apparent. It remains with the miller to determine whether he would prefer the first break machine or a good wheat polisher to make a final cleaning of the wheat. When the wheat is only split on the first break that cannot be justly regarded as a reduction, as it does not add to the capacity of the following rolls to a finish. It is simply a wheat cleaner.

We wish to be understood in presenting this flow for small mills that we are not advocates of the two break system, except for small mills operating upon local and exchange trade, for the reason that in two breaks the corrugations on the first break must be fine and the set very close to insure perfect finishing of the bran on the succeeding break, by which means soft flour is made, which would not be suitable for merchant milling, but which will give good satisfaction for household use.

In three breaks we have the true scientific system. The corrugations on the first break can then be made coarse so that only a small percentage of flour is made, and a large percentage of middlings and the germ relieved entirely, and without being crushed or broken. In this break, also, fully two-thirds of the entire work is accomplished, and the unfinished stock from the scalper going to the second break is left "ragged," so to speak—not "crushed." So that the action of the second break produces a fine quality of granular middlings and leaves the stock so that it is readily finished by the bran roll or third break. The product from these two breaks being handled independently from that of the bran rolls, and having been made by only two abrading actions on the bran, we necessarily have a clear, sharp, break chop, free from fine fibre which fine gentle scrap-iron action would produce.

I now call attention to program, figure 2. This plan of making out flow-sheets by the use of numbers and letters of reference, we have used in preference to tracings owing to the fact that it is simple, much more convenient both for the miller and the millwright, and there is much less danger of mistake; besides which the eye may glance in an instant from the letter of reference to the number referred to; whereas in tracing the lines much time is required, and mistakes are liable.

This program embraces, as we believe, all the machines necessary for a complete and perfect one hundred barrel three break mill. It embodies the three fundamental rules before referred to. There are no returns; sharp stocks cannot reach the tail of the mill; fibrous material is thrown from the tail of all the reels where it is practicable, they being under control by reverse conveyors at the tail of reel. A complete finish is assured by the use of an abundance of tailings roll surface and a bran and feed duster. The last finishing roll is simply a sentinel to catch any material which may reach that point in the mill. We have nine round reels, eight feet long and thirty inches in diameter, also one centrifugal reel to operate upon the bran and feed duster stock, which is the only low grade flour we make. The grades of flour above the low grade, that is, fancy patent, second patent and family, as we have denominated it, mingled together will make a high straight. The fancy patent and second patent will constitute about eighty per cent. of the entire output, and will grade with the standard patents. The yield may be made as close as the miller desires it, and the low grade will vary from two to ten per cent., according to the manipulation of the tailing stock.

The break roll surface is 72 inches. The smooth roll surface is 132 inches. The entire roll surface is 204 inches, or in round numbers two inches of surface to every barrel of flour in twenty-four hours. This is double the surface advocated as necessary by some of the prominent short system writers, and while we are fully aware that this roll surface will produce one hundred and fifty barrels in twenty-four hours with a fairly good finish, yet to allow for all the contingencies of climate and wheat, and to insure a granular flour of a high market value, a small percentage of low grade and perfect finish, a less amount of roll surface is not to be desired.

All of you who have read our articles on short break milling from time to time, in the milling journals, understand fully our position on the "short break system." We have never advocated a reduction of smooth roll surface; neither have we advocated the system of making flour on the breaks. Our stand has been: "Reduce the number of breaks and increase the length of rolls." "Make middlings and maintain an extended smooth roll surface." And the experience of the large merchant mills which have followed out this line has

demonstrated its correctness. It is a fact not generally known that more middlings can be made with three than with six breaks, if the rolls are properly corrugated, and a sufficient amount of surface and depth of corrugation are provided to prevent a crushing action on the stock as it passes through the rolls. And inasmuch as sharp granular middlings are what we seek for in high grade milling, we can conceive no reason for operating upon the wheat six times; producing six abrasions of the bran, when three accomplishes the work better and produces less fine fibre to discolor our break flour. One important fact the opponents of the three break system have never thought of, and that is, that in the elongated system of breaks unbroken or half grains of wheat passing through corrugated rolls and being only gently touched, the action of the corrugation is merely to scrape bran gently, thus producing a fine fibre which will bolt. A more severe action produces a coarse fibre which will not bolt, and herein lies the secret of rapid reduction supremacy.

We do not wish to be understood as taking a radical position against the advocates of soft reduction and the production of as much flour as possible. We are fully aware that mills operating in that manner are doing good work for local and exchange trade. Such a production will make a very fine, white flour which will please the housewife, but not the baker; and in some localities such flour would meet with more favor than a more granular product; but such a system will not do for general merchant milling. It has been tried and abandoned; whereas three break mills changed over to make middlings on the breaks have never changed back and never will not one of them.

We now come to the consideration of the question: "What is the best system of machine for general bolting?"

The genius of Europe and America has been working for years to produce some practical advance upon the old hexagon style of bolting chest. Numerous designs of bolts have come to the surface and disappeared. The old hexagon reel held its own against all new-comers, until the centrifugals began to make inroads upon its established prestige. European mills drifted largely into centrifugals owing to the enterprise of the many competent manufacturers. The millers entered the centrifugal craze army much as the women floated along with the temperance crusade—much talk did it.

These reels found their way into America and are now being built by nearly all prominent mill builders. About three years ago the inter-elevator round reel began to show signs of vitality; and has steadily gained in favor until the battle of supremacy has resolved itself down to these two forms of reels.

We must accredit to Jonathan Mills, the merit of first sounding the war-whoop in favor of a system antagonistic to the high-speeded centrifugal; since that time round reels have often been springing up in every corner, and of varied construction, but embodying essentially the same elementary principles, that is, a slow motion round reel that will not bolt on both the ascending and descending side of the reel, whereby the capacity is increased proportionately to the increased surface of cloth utilized. It is found that these reels will bolt about twice the quantity of stock of the old-fashioned hexagon reel, thus enabling them to be made much smaller. Also that they require the least power of any style of reels made. Also, that they produce a fine dressing of the flour, and a gentle action upon the cloth. If properly constructed there is nothing to get out of order, and they will run for years without any trouble. These advantages have made the round reel popular and it is gaining in favor daily.

The drawing, figure 3, illustrates one style of these reels. The action of the material upon the cloth is clearly shown. The buckets revolve with the cloth, there being a space of about one inch between the cloth and buckets. The surplus material is elevated and delivered upon the descending side. The open space intermediate between each bucket prevents the reel from ever becoming clogged, as all surplus material, should there be any, will drop into the center of the reel. In this respect it differs from reels having a solid inside cylinder.

In regard to the centrifugal reel we are compelled, in justice to our honest convictions, to oppose it as a general bolter. We must give it credit for having the largest capacity of all the family of bolting reels, and also to be a good machine for handling bran duster stock and soft tailings stock, which is of such a soft, greasy nature that it requires pounding through the cloth to get it to bolt in any quantity, but outside of these two merits we are unable to perceive of any possible argument in its favor, but much against it—so much that it can only be a question of a very short time when it must

take its legitimate position at the tail of the mill as a bran dust sifter.

Our reasons for this statement are so numerous that it would require more time than we have been allotted to present them all. We will only refer to a few of the most prominent:

First: The high speed is against it, not only in the matter of absorbing power and difficulty of drive, but also in the matter of injury to the stock by the severe beating and abrading action. The flour thus produced by the beaters must necessarily be soft and of a much finer nature than the other granules of flour with which it is intermingled, consequently the tendency is to the production of uneven flour, some parts harsh and others soft. In support of this position, we need only to state to this intelligent assembly of millers that an ordinary centrifugal reel with beaters twenty-four inches in diameter, and running at the ordinary speed of two hundred revolutions per minute, will travel in the course of one day of twenty-four hours a distance of 327,27 miles. The stock being operated is pounded against the buckets and ribs and cloth at a speed equivalent to the velocity of the beaters. Assuming three hundred working days in one year, we have an aggregate travel of 98,181 miles per annum, quite a journey for a "gentle bolter"—about the kind of journey that Buffalo's illustrious townsman, Cleveland, would like to have the "high protective tariff" bolting democrats take.

In order to show the action of different modifications of the centrifugal reel we have shown three modifications of elevating devices and, also, a part of the reel at the bottom without any elevating device. All of these modifications are in use. It will be seen that should the outside reel have no elevating mechanism as shown at the bottom of this figure the action of the beaters would be to scrape over the stock for about one-fourth of the reel's circumference, absorbing power and grinding the material to a soft condition. To avoid this, buckets have been devised of various forms to elevate the stock and drop it upon the beaters. Some of these elevating buckets are made stationary as shown at b, b, b. Some depend upon a stationary rib to elevate as shown at c, c, while others arrange a dumping bucket to elevate and deliver the stock in bulk upon the beaters as shown at a, a, a. Either one of these devices is an improvement upon the scraping action, and we may be permitted to express it as our opinion that the "V" shaped bucket is the preferable style, owing to the fact that in its elevating action it will begin to spill gradually the moment it reaches a position above the stock at the bottom, and will continue to deliver stock in a spray upon the beaters until it reaches a position half way down the opposite side of the reel. The pointed "V" shaped bucket also offers the least resistance to the stock and air in motion. The stationary ribs as shown at c, c, have been used mostly on octagon reels and answer as elevators, but most manufacturers have now abandoned that style.

The dumping bucket arrangement probably has the most capacity of any form for the reason that the stock is dropped in a large volume at once, and, consequently, is thrown bodily out against the cloth at a velocity of 13.66 miles per hour. The material strikes the cloth in bunches with such force as to produce an action on the silk similar to that of half-stones dropping in a mill pond. Every miller who has operated machines of this kind has observed this action in all cases where the reel has been thoroughly loaded so that the buckets drop a volume of stock at once. The action is precisely the same as it would be were you to take a scoop full of flour and throw it against a bolting cloth suspended six inches in advance of the point where the flour left the scoop. And in view of the fact that the stock is thrown out at a speed of 1,200 feet per minute, it is folly to assume that such would be a "gentle action;" upon the other hand it is the severest kind of force, and it stands to reason that if fibrous material reached the cloth in advance of the coarse material it would necessarily be forced through the silk.

It must be remembered that the material in a centrifugal reel cannot possibly bolt while it is sailing around the cloth at a speed of one-half that of an express train. It don't get time to go through the holes. If you pour a bucketful of marbles on an inclined board filled with holes four times as large as the marbles, they will jump every hole; so we say no bolting is done on a centrifugal reel except when the material is thrown out at right angles with the mesh, or very nearly so, and we may also add that when the material is delivered in a gentle spray as it necessarily must be in a bucket constructed "V" shaped, as we have illustrated, the best results will be obtained.

Now, in regard to the power required to operate a centrifugal reel we are safe in the statement that one

centrifugal reel eight feet long and thirty inches in diameter will absorb the power required to operate three round reels of equal length and diameter. The width of driving belt is no indication of the amount of power being transmitted. The speed the belt travels is the correct measurement. Give us velocity enough and we will drive a one hundred barrel mill with a fiddle string. There are certain fundamental laws of matter which no ingenious or delusive theory can refute. We cannot raise a pound of material from the bottom of a reel to the top two hundred times a minute without applying two hundred pounds of power. Neither can we paddle air around 327 miles a day, with its friction against cloth and buckets, without absorbing power.

And thus we might go on multiplying reasons why the centrifugal will ultimately lose its precedence, but we may be permitted one more ominous reason, and that is, the American mill builders and millers have nearly all learned and recognize the truth of the statements we have herein made, and as between the centrifugal and the round reel they are, with but few exceptions, choosing the latter.

Revolutions never go backward; and until some brilliant genius shall discover something superior, we may confidently expect that the round inter-elevator bolting reel will remain the queen of the bolting floor.

THE PNEUMATIC PROCESS.

ON this system neither the flour substance of the interior of the berry nor the fragments of bran skins have been crushed or incorporated into each other by pressure and abrasion between two hard surfaces. The bran skins have the appearance of being ruptured on their natural line of separation from the flour substance, and the latter by a sudden shock freed from and knocked entirely out of them, leaving them free from flour and in the same shape or form they occupied before they were detached from the berry, and as bran skins and flour substance possess very different degrees of toughness, density and frangibility (bran being fibrous and flour substance friable or brittle), it follows that, however finely the bran skins may be reduced by the impact, the flour substance on them must be reduced still finer; here they can be readily separated by the usual sieving or bolting apparatus. The flourless condition of the bran skins made by the process, so different from that by the millstone or roller process, shows that substantially all the flour substance in the interior of the berry has been knocked out of them and its ultimate particles separated by the shock, without heating or impairing their natural properties, while on the roller or millstone system a considerable quantity of good flour will always be found adhering to the bran skins, which cannot be profitably removed, because it has been compacted, incorporated or actually ground into them by great pressure, attrition and abrasion between two hard surfaces, as with rollers and millstones. This accounts for the increased quantity and quality of flour obtained by the pneumatic process over any other.—Gilbert Little in the *Miller*.

GREAT CHANCES FOR THREE INVENTORS.

PROF. R. H. THURSTON in the *Forum*, says: "I have often taken occasion to remark that the world is waiting the appearance of three inventors, greater than any who has gone before, and to whom it will accord honors and emoluments far exceeding all ever yet received by any of their predecessors. The first is he who will show us how, by the combustion of fuel, directly to produce the electric current; the second is the man who will teach us to reproduce the beautiful light of the glow-worm and the fire-fly—a light without heat, the production of which means the utilization of energy without that still more serious waste than the thermo-dynamic loss now met with in the attempt to produce light; while the third is the inventor who is to give us the first practically successful air ship. The first two of these problems are set for the electric engineer, and we may be pardoned excess of faith, should it prove to be such, when, contemplating the enormous gain to humanity which must come to such inventions, we look confidently for the genius who is to multiply the wealth of the world to an extent beside which even the boon conferred by the creators of the steam engine and the telegraph will not appear overshadowing. When this inventor comes forward, and most probably not till then, it is very likely that we shall see steam superseded by a rival.

Samuel Mick has been convicted of setting fire to the Marquette flouring mills at Portage la Prairie, Man., recently, and has been sent to the penitentiary for five years. Indignation is expressed that White, the man who instigated Mick to commit the crime, has not been punished.

THE MODEL MILL AT THE MILLERS' CONVENTION.

TWENTY thousand people at least, and some compute the number at 25,000, says the *Buffalo Evening News*, have visited the model flour mill in front of the Genesee house since Monday. It is kept running night and day and many who wish to enter are turned away, as the pretty little structure will accommodate but a limited number at a time.

A reporter who visited the model mill yesterday saw a moving throng inside passing and repassing the many open windows, and a large number of the visitors were ladies. All the delegates to the millers convention gave the machinery careful inspection, of course, and many were the praises heaped upon the excellence of the machinery made by the Geo. T. Smith Middlings Purifier Company, of Jackson, Mich., to whose enterprise the novel exhibition is due.

Last Sunday's *News* gave its many readers a view of the mill and elevator, and public curiosity was whetted to a high degree to see the unique sight of a mill brought here in

"Self Help." He has succeeded because he earned success, and that is the secret of all true progression.

Most of the delegates are personal friends of Mr. Smith, brought into contact with him in a business way. All the millers concede the great changes wrought in their industry by his inventions and are not slow too in giving him credit, and many are the expressions of approval heard from them as they surge about the Genesee, their headquarters, and take in all the many points of excellence of the model mill. It is a leading feature of the convention and throws everything else into side-light.

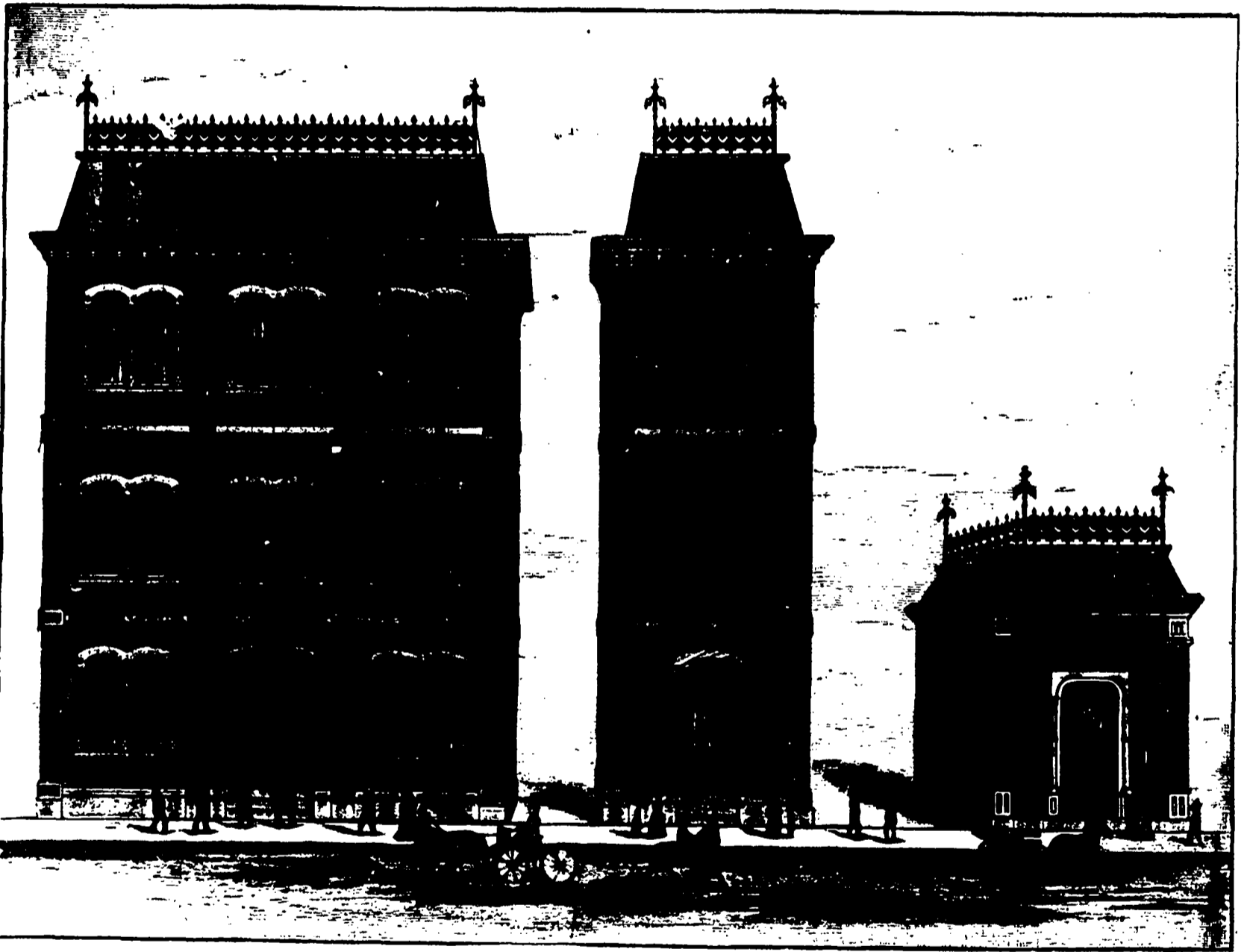
As a result of the company's enterprise, it is said that a large number of orders have been received by them while here for their famous milling machinery, and in several cases the orders amounted to complete milling outfits.

Speaking of the model mill, the *Roller Mill*, of Buffalo, says: "The term 'portable mill' has received through the latest enterprise of the Geo. T. Smith Middlings Purifier Company a height and breadth of meaning which its originators could not have imagined

for the Aladdin of this enterprise, they might have observed a large man in a black silk hat, whose ceaseless activity, coupled with an air of authority, marked him as the moving spirit of the busy scene. That man, was, of course, Geo. T. Smith.

From Buffalo the Geo. T. Smith Company intend to take their mill to Cincinnati, where it will remain three months in operation, selling and delivering its flour like any stationary mill; thence, next season, to Paris, South America, and Australia. In all these places it will certainly be a chief centre of interest, and as an advertisement of their system, now so well known in this country, it cannot fail to bring universal celebrity to the Geo. T. Smith Middlings Purifier Company.

The *Buffalo Evening News* further says: It seems that a proposition has been made to Mr. Smith to erect his model mill on the Buffalo fair grounds during the great exposition which opens here in September. It could not be ascertained what inducement was offered, but it is well understood that the committee having the matter in charge are making every effort to bring about the happy result. The *News* earnestly hopes that the



THE "INTERNATIONAL" MODEL MILL.

sections, set up in a few days and now grinding wheat into flour at the rate of 50 barrels a day.

"What do you do with all the flour?" Mr. Smith was asked.

"Well, to tell the truth," he replied, "we've given it away so far. We could sell it, of course, and dealers would be very willing to handle it for us, but so far we have sent it to charitable institutions in the city and to many in Buffalo who have been kind enough to extend courtesies to the millers' convention."

A few hundred barrels of flour are, in fact, no more than a drop in the bucket to the company, who are reputed to be one of the wealthiest and most progressive business concerns in Michigan.

Mr. George T. Smith is in Buffalo with the mill and gives his personal supervision to running it. He is a practical miller and knows every point about the complex machinery as well as a printer knows his case or a fashionable lady the proper style of bonnets. The history of this gentleman's life, as exemplifying what great results may come from steadfast determination united with clear intelligence and inventive faculty, would make a fitting chapter in such a book as Samuel Smile

in their wildest dreams. Hitherto we have understood a portable mill to consist of a single grinding machine capable of being moved from place to place on farm or plantation. Now we are confronted, at Convention headquarters, by a three-storey structure of good size and containing the entire equipment necessary for making fifty barrels daily of high-grade roller flour on a famous centrifugal system, and are fain to declare, on the strength of what we have lately seen and heard, that this latter must be the true portable mill.

On Saturday, June 2nd, this mill was making flour in Jackson, Mich., over 400 miles away. Between that time and the evening of Wednesday, the 6th, it was taken down, packed in freight cars, and shipped to Buffalo. By Thursday evening its walls and roof were again erected, in Genesee street; by Friday evening the machinery was in place and the adjoining grain elevator about completed; and before dusk on Saturday the connections were all made preparatory to manufacturing flour.

No wonder the good burghers of Buffalo gaped with astonishment at the fairly magical rapidity with which the mill grew and took shape. And had they looked

efforts will be successful, as no greater attraction for the first in the series of grand expositions in Buffalo could be found.

It is settled, however, that the model mill will go to Cincinnati first. The Ohio Valley Centennial Exposition opens there July 4, and its managers will not take no from the company, and they have finally been persuaded to run the model mill on the Cincinnati exposition grounds. It will be taken apart to-morrow or next day, packed on cars and sent on to Cincinnati, returning in all probability to Buffalo in September.

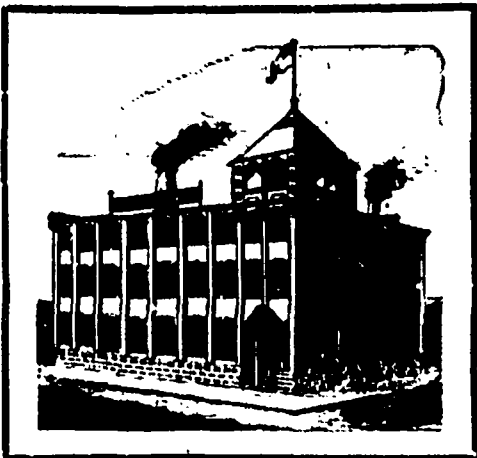
Buffalonians who have not yet inspected the novel sight of a mill almost a toy in dimensions grinding out the highest grade flour at the rate of 50 barrels a day, should not let the opportunity miss them. All are cordially welcomed, and ushers are on all four floors ready to explain all the workings of the 36 machines.

We mentioned some time ago that it was rumored that the Geo. T. Smith Co., of Jackson, Mich., were thinking of removing their workshops to some city which would offer them a more commodious site. We observe that the Buffalo papers are pointing out to the Company the advantages which that city can offer, and the people of Buffalo are also being urged to make an effort to induce the removal of such an important industry to their city.

THE BAG AND HESSIAN FACTORY OF CANADA.

THE CANADA JUTE COMPANY, Limited,
Of Montreal,

Will remove their Works early in March to their New Factory, corner of St. Martin and Basin Streets, just below Notre Dame St. Machinery of the best and latest design has been put in, and the capacity of the works has been doubled, 30,000 Bags being daily output.



A Special Feature is the MACHINERY FOR MANUFACTURING HESSIAN CLOTH. Every quality and every width can be supplied same day as ordered.

BAG PRINTING MACHINERY of the most improved pattern has been also put in, and special attention will be given to this branch.

**BAGS, HESSIANS, TWINES,
PADDINGS, BUCKRANTS, CANVAS**

THE CANADA JUTE COMPANY, Limited,

ONTARIO AGENTS: MESSRS. STARK BROTHERS,
62 Front Street East, TORONTO.

15, 17, 19 and 21 St. Martin St.

- MONTREAL

To Mill Owners and Manufacturers.

— **USE** —

Phoenix :- Belt :- Oil,

THE ONLY PERFECT BELT DRESSING.

TO BE HAD ONLY OF

F. E. DIXON & CO,

— MANUFACTURERS OF —

PAT. LAP-JOINT LEATHER BELTING STARRIVET

Send for Price List and Circulars and our latest Pamphlet on Belting.

70 King St. E., Toronto.

FAVORITE MILL BUCKETS



Manufacturer and Dealer,

JOHN RADIGAN,

68 Mary Street,

HAMILTON, ONT.

SEND FOR PRICES.

TORONTO BAG WORKS

JUTE AND COTTON BAGS

MANUFACTURED

IN ALL SIZES AND QUALITIES.

NEW FACTORY on Bay Street now in full operation.

THE ONLY FACTORY IN CANADA

Printing Jute and Cotton Bags in their own premises.

ORIGINAL DESIGNS FOR BRANDS PREPARED FREE OF COST.

Send for Price List and Pamphlet giving full information,

DICK, RIDOUT & CO.

==== PROPRIETORS ====

11 & 13 FRONT ST. EAST

- TORONTO.

THE PREVENTION OF ACCIDENTS.

A NOVEL exhibition is announced to be held in the city of Berlin, Prussia, commencing in April of next year, and continuing for the period of four months. The purpose of this exhibition will be to show how accidents may be prevented. The following programme will show the scope of the exhibition:

- Groups 1 and 2. Prevention of accidents near movable machine parts, generally; protective devices in transmission shafts, toothed wheels, beltings; disengaging gears, lubricating appliances, etc.
3. Protective measures in the working of elevators lifters, cranes, derricks and other raising apparatus and machines.
4. Protective measures on motors.
5. Protective measures in the operation of steam boilers and other apparatus under pressure.
6. Preventive devices against, and safety devices in case of fire in insured works and workshops.
7. Providing for good illumination and prevention of accidents by means of lighting arrangements.
8. Prevention of accidents caused by poisonous (caustic or corrosive substances) obnoxious gases, etc.
9. Personal equipment of laborers.
10. Providence for injured persons.
11. Steps for the protection and well-being of working people in the metal industry.
12. Steps for the protection and well-being of working people in the wood industry.
13. Steps for the protection and well-being of working people in the textile industry.
14. Steps for the protection in the paper, leather and polygraphic industries.
15. Protection in the industry of articles of food and consumption.
16. Protection in the chemical-gas industries.
17. Protection in the milling and quarry industries.
18. Protection in building trades.
- 19 and 20. Protection in the trades of intercommunication.
21. Protection in the farming and forestry industries.
22. Literature (Library of the Exhibition).

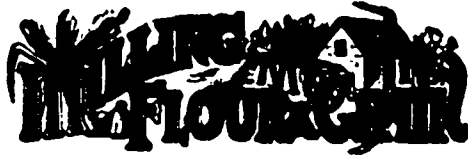
This shows an intelligent regard for human welfare unknown in this country, says the *Indianapolis Millstone*, and is to be emulated. Little is thought of the prevention of accidents by special means, in the factories mills or quarries of this country. In certain instances mild precautions are taken against dangers. Accidents are so frequent in some of our manufacturing establishments that a surgeon is regularly employed, not alone for the purpose of caring for those who are injured, but for collecting evidence to be used in court against the injured party in case of suit for damage.

Most accidents are preventible. Certainly a very large proportion are altogether unnecessary. Where is the manufacturing establishment where it is not possible for regular attendants or visitors to come in danger of contact with moving machinery? Means are ready at hand for him to lose a hand, or a finger, or an arm, or suffer other injury if his attention is diverted even for a short time. He may hack up against a set of gears; he may be crushed by a piece of planing machinery; he may be caught in a belt; he may be burned, poisoned or he may fall down badly constructed stairs. These and many other accidents may happen to him as he passes about a manufacturing establishment. There are other accidents which may occur to the watchful in the course of the regular discharge of duty, which are possible because of the improper arrangement and construction of the devices employed.

The articles to be exhibited will consist in machinery, apparatus of all kinds now in use, to guard against accidents in tools, working pieces and working materials; in models, in plans, drawings, photographs and specifications; in copies of regulations, rules for factories, statutes and printed matter relating to accidents and to their prevention.

As a rule the exhibition of articles in natural size and of models will be prepared. Machines should, as much as possible, be exhibited in operation. Since not only protective contrivances but also complete machines and apparatus with protective devices are to be exhibited, the exhibition will have, to some extent, the character of an industrial exhibition, with the difference only that objects which serve solely for technical purposes and can not be classed as contrivances for the protection of working people against accidents, are excluded. It is not intended to show merely the efficiency of any machine, but rather the efficiency of the same in connection with devices for the prevention of accidents. The best protective device renders a bad machine not recommendable; but a machine, good in itself, furnished with model equipment for the purpose of preventing, as much as possible, accidents, must in future, considering

the burden, under the accident laws, cast upon the trade associations, of necessity deserve preference over a like good machine, being, however, without satisfactory appliances for protection. The exhibition will, therefore, offer an opportunity particularly to all manufacturers of machines who hitherto have taken a special interest in the question of such protective measures, or, in future, intend to do so, to introduce their productions to the members of trade associations.



Mr. Wm. Hathaway has purchased Lindsay's mill at Westover, Ont.

The new roller flour mill at Moosomin, Assa., is advertised for sale.

The machinery in the old Durham mill is being removed to Kinmount.

An addition is being made to Mr. McMillan's grist mill, Collier St., Barrie.

Messrs. Sadler, Dundas & Co., of Lindsay, are erecting a new engine house.

Messrs. Ogilvie & Co. will erect three or four new elevators in Winnipeg this season.

Two new elevators of a capacity of 1,300,000 bushels are to be built at Thunder Bay.

The grist mill at South River, which was recently badly wrecked by floods is again in operation.

The bonus by-law of \$2,000 for a grist mill at Treherne, N. D., has been carried unanimously.

The flour mill at Carberry, Man., after being refitted with new boilers, is now in successful operation.

The old grist mill was among the buildings destroyed by the recent disastrous fire at Chesley, Ont.

Work is progressing rapidly on Messrs. Dolson & Campbell's new mill at Woodville, Ont.

Woodworth's elevator at Deloraine, Man., with a capacity of 30,000 bushels, is almost completed.

Messrs. T. & A. R. Snider, millers at German Mills, Ont., have found it necessary to abandon their estate.

Berkeley's mill at Cambry, Ont., has been shut down to allow of the introduction of roller process machinery.

The Grand Trunk elevator at Midland, Ont., is to be rebuilt and its capacity increased by 250,000 bushels.

The Moody Mill at Dunnville, Ont., is said to be prospering under the management of Mr. Duncan Moody.

Messrs. Mather & Sancier, Stoney Point, Ont., will remove their mill to Amherstburg, if a \$1,000 bonus is insured.

Messrs. Johnson & Barclay have put in \$1,000 worth of new machinery in their oatmeal mills at Portage la Prairie.

A farmers' "Combine" at St. Mary's binds its members not to sell eggs for a pittance and buy oatmeal at exorbitant prices.

New machinery is to be placed in Messrs. Craig & Sons flour mill at Napanee, Ont., for the purpose of increasing its capacity.

It is claimed that Winnipeg grain dealers have cleared \$700,000 by the advance in wheat. Of this the Ogilvies cleared about \$150,000.

About \$500 has been subscribed to a joint stock company which is being formed at Belwood, Ont., for the erection of a grain elevator.

An energetic gentleman of Omenice, Ont., is agitating for the formation of a joint stock company for the purpose of erecting a large roller flour mill there.

The action of the Ontario Oatmeal Combine in increasing prices has opened the way for the sale of considerable Manitoba oatmeal in the Montreal market.

Messrs. Johnson & Bartlett, of the Pioneer oatmeal mills, Portage la Prairie, are introducing improvements to the cost of about \$1,000 in the shape of new rollers, etc.

Mr. David Johnson, proprietor of the Pioneer oatmeal mills, at Portage la Prairie, Man., is receiving the congratulations of friends on his marriage, which took place on June 12th.

Tenders will be asked at once for the erection of a new mill for the Neepawa Milling Co., Neepawa, Man. Two thirds of the capital stock of the company has been subscribed.

Mr. Alex. Chapman, who operated for many years a grist mill at Lancaster, Ont., has got behind and has been compelled to assign. He is said to have been well off at one time.

The Qu'Appelle Valley, Man., flour mills have lately undergone improvements. The capacity of the mills has been increased and machinery added to improve the quality of the product.

Several of the grain elevators in the Northwest which were closed until after harvest, have been re-opened to receive the balance of last year's crop which some farmers have been holding.

The Grand Trunk elevator at Point Edward, is kept constantly running. Over 200,000 bushels of wheat and corn were unloaded last week from the vessel which arrived from Chicago and Duluth.

A considerable decrease in the number of mills, value of milling property and number of persons engaged in the industry, is reported from Victoria, Australia, for the year 1887, as compared with 1886.

The residents of Onondaga and Tuscarora townships, Ont., complain that the Caledonia milldam prejudicially affects their health owing to its causing the stream to become almost stagnant at certain seasons of the year. It was originally built by the

Grand River Navigation Company, and at present is used only by two grist mills. It will probably be removed.

An attempt is being made to induce Messrs. McDonald & McIntyre, of Oxford Mills, to move their roller mill to Kempsville, Ont., by the offer of a bonus of \$5,000, a site, and exemption from taxation for ten years.

Mr. F. Kent, for some years head miller at Ogilvie & Hutchison's mill at Goderich, has severed his connection with the establishment, and his place has been taken by Mr. Smith, formerly head miller of the Seaforth mill, of the same firm.

The ship Maggie McCrae, with 25,000 bushels of Manitoba wheat, from Port Arthur, consigned to Ogilvie & Co., Montreal, foundered in Lake Superior, from coming in contact with ice. Cargo fully insured. Cargo and vessel total loss.

It is reported that the markets in Prince Edward Island are quite bare of oats. Fully 100,000 bushels have been sent up the St. Lawrence from that province since navigation opened. The *Charlottetown Examiner* urges the establishment on the Island of oatmeal mills of the most approved kind.

At a recent meeting of the Neepawa Milling Co., the stock books showed that \$20,000 had already been subscribed out of the capital of \$30,000. It is expected to place the balance aside, and tenders for the erection of a mill will be called for immediately. A new elevator is in course of erection.

Negotiations have been concluded for the erection of a mammoth flouring mill with a capacity of 6,000 barrels at Duluth. The building will be 100 by 120 feet, six stories high, and is to cost \$130,000, with machinery worth \$400,000 additional. When completed this will be the largest mill in the world.

John F. McLaren, who has been connected with the oatmeal mills in Seaforth for the past five years, has accepted a position with the Messrs. Ogilvie to manage their Toronto business. Prior to his departure his late employers presented him with a handsome gold watch as a mark of esteem and appreciation of his services.

At the last meeting of the Ontario oatmeal millers, held at the Walker House, Toronto, the price of standard oatmeal was advanced 50c. per barrel, making it \$5.85 in car loads delivered in Toronto. All other grades were allowed to remain as they were, viz., granulated \$6.10, rolled oatmeal \$6.35 and rolled oats \$6.60.

Mr. Walter Thompson, of Mitchell, Ont., is moving his old grain warehouse across the railway tracks from its present site to his oatmeal mill, where it is to be converted into a general storehouse in connection with the mill. On the old site a large elevator is to be erected capable of storing from 40,000 to 60,000 bushels of grain. The foundation will be of stone, and the structure will contain all the modern improvements, and will cost \$3,000.

Mr. G. W. Goodfellow, proprietor of the Aylmer, Ont., roller flour mills, shot himself a few days ago when arrested on a charge of incest preferred against him by his fifteen year old daughter. The business of flour milling contains probably as few "black sheep" as any other, but it is not entirely free from them as this terrible occurrence has shown. It is to be hoped the villains of the Goodfellow stamp are few and far between.

A German miller has recently been sentenced to five years' imprisonment, for having pilfered the property of his customers by the systematic use of a corn-dressing machine fitted with a concealed spout, which swallowed up, at each dressing, from one-fourth to one-half of the grain fed into the hopper. The culprit was stated to have secured a very large gristing trade by offering to the simple peasants the bait of a grinding fee, which was ostensibly fifty per cent. below the rates current in the district.

The following is a list of the import duties levied on wheat by various European countries:

	Per 100 kilos.	Per 480 lbs.
Austro-Hungary.....	3f 75c	6s 6d
France.....	5f	8s 9d
Germany.....	6f 25c	10s 11d
Italy.....	5f	8s 9d
Spain.....	4f 20c	7s 4d
Sweden and Norway.....	3f 50c	6s 1d

An American contemporary suggests, as an economical improvement in mills, an extra reel, more particularly for treating low grade. A double reel would be preferable, the inner reel to act as a scalper, clothed with about No. 6 silk, or its equivalent in wire, with a coarser number at the tail. The outside cylinder would of course be clothed to suit the material, and should be easily changeable, in order to treat any stock that may from time to time be desired. Screenings could be ground and dressed thereon, and make a fair quality of low grade; whilst light fluffy material, which it is desirable to keep separate from other grades, might also be accumulated and dressed on this reel, the resulting flour being rebolted and still further improved.

The A. S. Whiting Manufacturing Co., of Cedardale, Ont., are building an addition to their works.

The new planing mill at the head of Gloucester Bay, Midland, is almost completed. It will plane about 8,000,000 feet annually.

The Minister of Public Works has acceded to the request of the mill owners at the Chaudiere, and decided to appoint a commission of engineers to examine the channel of the Ottawa river in order to see what damage has been occasioned to the main channel by the deposits of sawdust. One of the engineers will act in the interests of the lumbermen.

The town of Nibley, in the Northwest, promises to become quite an extensive lumber manufacturing centre. There are said to be inexhaustible spruce forests in the Riding Mountain district, above the town, and as it has been found impossible, owing to the rapids, to drive the timber any further than Nibley. New mills will probably be erected there for its manufacture.

The Chaudiere Lumbermen are reported will probably pay up their arrears of rent of water privileges to the Government, while the latter will make some little modification in the laws. The lumbermen propose that certain necessary improvements on the river be undertaken by the Government, the cost of the same to be assessed on the basis of the water privileges.

THE MOTIVE EQUIPMENT OF FLOUR MILLS.

THIS subject is one not wholly new in text or discourse, says Mr. J. A. Lawrie in the *Milling Engineer*, and may, perhaps, not prove more interesting than the majority of current milling topics. From my somewhat extended experience, I see that there is much to be improved on, not only in the system of flour mill furnishings, but whatever machinery is used in manufacturing. Capitalists, or rather proprietors, who are necessarily financiers rather than mechanics, care not what their plants may be, providing the output is up to the required point, and no lost time through stoppage for repairs.

Starting at the steam engine or water wheel, or both (usually both), the purchaser enters a market literally crowded with the best, the very cream of mechanical ingenuity, skill and excellence of finish, where he finds so much of the good that selection becomes a difficult matter.

In the matter of steam engines, there are several excellent machines built by responsible builders, who stand behind their work in every particular. The choice then becomes one of personal vanity, it might be called, rather than of economical operation and efficiency.

Water wheels are about on the same principle, though of more different grades and degrees of adaptability. In purchasing a steam engine one can know exactly how much steam he must provide for its use and can arrange for this provision, while in selecting a water wheel he must be governed by the available amount of water he controls. Usually this amount is fixed, that is, not to be increased, but on the other hand is yearly declining. Therefore he must look well to his steam in selecting the water wheel.

Shafting, gearing, pulleys, hangers and boxes constitute the balance of the subject, but in them will be found ample room for consideration. A shaft is but a round, straight bar of iron, finished diametrically, and is supposed to be the same whether made by Mr. Lathe or Messrs. Rollem. There is considerable difference sometimes in shafting, too. Look around a little and you will see that the makers of the best shafting usually make the best of its accessories

When you are setting up your mill, place your order with some modern concern, one that will do you a "pon honor" job. You can't afford to buy by the pound always. One party may bid 6 cents, finished, intending to do the work in a prompt and thoroughly satisfactory manner. They have to do it, in fact. Meeting large and close competition, they have reduced the cost of production to a minimum, modernized their patterns and designs and are prepared in every way to sustain their hard-earned reputation.

You think 6 cents too much, do you? Well, you can find plenty who will accept your work at 4½ or 5 cents per pound. They are either worn-out institutions or one-horse concerns that look on a dollar almost reverently. They will do your work for you, but you must take what they give. Their patterns were made some time since Noah was a boy, and, unlike whiskey, have not improved with age. From them you get a pulley with letter 8 arms, run twice as heavy as necessary, and hub to match. But it only cost 4½ cents, you know. Yes, I know, and it weighs just 650 pounds, while the "big shop" would have furnished you a modern pulley of the same size weighing only 450 pounds. See! you have paid \$2.25 for a lot of cast iron that is of no earthly use to you, besides paying freight on 200 pounds of antiquated ideas, to say nothing about future expense for lubrication adduced by excessive loading of shafts.

Gearing comes along in about the same shape, heavy, ill proportioned and bungling; mortise gears and pinions where the iron cogs are as rough as when they left the sand, they are also of equal thickness with the wooden cogs, roughly and poorly filled, because Mr. Four-and-a-half Cents can't afford to pay good workmen. The hangers and boxes are in no better condition. Really, it seems as if the maker of those patterns has been in league with the foundryman, or has been trying to see how much metal can be palmed off on the unsuspecting public. This is what you get for 4½ cents per pound, and I mistrust that long before you start up you are heartily sick of your bargain.

Another consideration in purchasing should always be future additions and repairs. Here, again, the six cent man has the advantage. His establishment is a permanent feature. Engaged in a line of manufacturing that is profitable, he invests the proceeds in large,

substantial, well equipped shops, and is prepared to turn out the best of work in his line. Of course the miller does not consider this when selecting his outfit. The usual plan is to specify what machines he wants, then taking the power transmitters as though thrown in.

Now-a-days mill furnishers are prepared to contract for the whole mill. Some, even, will undertake construction of buildings and installation of motive power, all under one contract. These firms are all responsible, yet there may be a great difference in the quality of work turned out. In fact, one firm may adhere to old fashioned ways, and if forced to make a new pattern, they copy the design of their leaders, saving the old pattern to work off on some by-the-pound chap. Close investigation into the details of your outfit will amply repay you in the long run.

Having purchased your outfit, the next step will be to get it "set up" in the mill. This you may have done by contract or by the day. This latter plan, though usually the more expensive, is, when finished, more satisfactory to the owner. The fact that contract jobs are usually unsatisfactory is well known, though the cause therefor lies in the miller himself. It is not because the contracting party does not desire to do or can not do a first-class job. It is because you demand much for a little that he is unwillingly forced to sacrifice a portion of his reputation or lose the job.

Of the two ways, contract or day work, the choice depends more on the mill owner than aught else. If he has a miller competent to plan and supervise the job, with the assistance of a good millwright to attend to the mechanical minutiae, the result will be a first class job, costing no more than if "let out." On the other hand, where the owner depends on the fitting miller, he had better go at once and contract the whole job, as he then stands a better chance of securing a miller to fit the mill. Mistake in this matter are of common occurrence, and my firm belief is that if one man can obtain satisfactory results from your mill, and you lose him, it is better to find another of the same stamp than to change over to suit some other fellow. If you do this you lessen your chances of success by getting a man that you are not sure of keeping and getting a mill that shows no certainty of keeping you. This is where one must exercise a good deal of judgment, and I think that past experience will materially assist them in making future selections.

Hurford Reels and Scalpers are furnished in one, two, and four reel chests, 6 feet, 8 feet, 10 feet, 12 feet and 14 feet lengths.

Are also extensively used to replace six sided reels in old chests, doubling the capacity and greatly improving the quality.

No change of driving gear necessary.

Pillsbury has 30 Hurford Reels doing the work of 60 six sided reels in a mill at Minneapolis.

We contract for mills complete on our improved system of rolls and bolting, and guarantee the same the best in Canada.

HURFORD BOLT AND SCALPER

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

THE HURFORD FLOUR BOLT

THE COCHRANE ROLLER MILL

RUNCIMAN BROS.

Mill Builders and Mill Furnishers

SOLE MANUFACTURERS FOR THE DOMINION OF CANADA OF THE

HURFORD BOLT

AND AGENTS FOR THE

COCHRANE - ROLLER - MILLS.

OFFICES: 20 & 22 MAIN ST. EAST, HAMILTON.

In a recent test of the most approved modern round reels, made at the Galaxy mill in Minneapolis under the exclusive auspices of the proprietors of the mill, the Hurford Reel scored an unqualified victory, showing more than double the capacity and far better results than any of its competitors.

We have made arrangements with the manufacturers of the Cochrane Roller Mill Supply Co. as special agents for the sale of their train roller mills. Parties wishing information as to purchase will do well to write us for prices and other information.

THE NECESSITIES OF MODERN MILLING.

THE following abstract of a paper on the above subject read by Mr. J. R. Reynolds before the Millers' Convention at Buffalo last month, is full of practical thought and will repay careful perusal by Canadian millers:

There are several necessary improvements, other than those alluded to, which, if developed, will aid us. Greater care in the construction of the mill, so that it may be more easily adjusted to meet the diversified condition of the wheat and atmosphere; greater simplicity in construction and increased excellence in action of the machinery used, and the exercise of proper skill in the arrangement of the machinery in the mill, will avail us much. It will be granted that the tendency in mill building for a few years has been toward simplicity in the construction of the mills, simplicity in the construction of machinery, simplicity in the separations throughout the mill. Millers are feeling more keenly than ever that the value of any milling system depends entirely upon its earning capacity, that is, upon the benefits and increase which can by proper management be realized from it. Experience is a persistent teacher, and it is because millers realize they have scored mistakes in the past that they are making efforts to improve the appointments of the building, the machinery and the flour manufactured. With the advent of the roller system, machinery was arranged in the mill to accommodate the building. By the result, many of these mills are complicated, and it is with the utmost endeavor they can be made to produce first-class goods. In many of these mills more wheat is taken to make a barrel of flour than should be used, or than is necessary in a mill where the machinery is properly arranged, other things being equal, and the cost of operating (as compared with some modern mills) must of necessity be greatly enhanced. It is safe to say, that so far as the millers, engineers and packers are concerned, the cost of operating a modern mill of say 1,000 bbls. capacity is no greater than that of operating one of 500 bbls. capacity which five years ago was made over from an old stone mill. The cost of power in a modern mill is likewise greatly reduced. In the mills more recently built, the buildings are constructed with the idea of accommodating the machinery, and also with a view to their being more readily adjusted to the natural changes which are constantly taking place. Such arrangements are necessary to enable the miller to take advantage of all that will, in any manner, assist him in reducing the cost of manufacture.

There can be no doubt that improvement in milling will continue, although no miller can with certainty foretell what its future phases of mechanical development may be. Still we are satisfied that the ultimate goal must of necessity be toward cheapening and lessening the power required to run the mill; decrease in the cost of operation, so far as the number of men necessary to tend the machinery is concerned; decrease in the quantity of wheat taken to make a barrel of flour, and an increase in the superiority of the flour produced. It is somewhat surprising to see the decrease in the number of elevators, conveyors and cumbersome machines used in the best constructed modern mills, and I apprehend this improvement will go on apace until the old system of conveyors, hexagon reels and unwieldy purifiers, will be relics of the past. These improvements are forced in a measure by the powerful stimulant of close competition, but I am satisfied that with the shrewd business capacity of the millowners, excelled by none; with the inventive genius of our mechanics, unequalled by any in the world, with the utilizing of our apparently unlimited water power, and with the proper adjustment of shipping rates, we shall be able to battle successfully in the markets of the world and dispose of our surplus wheat in the flour.

The profit lies, we are told, in the increase of business, hence many millers have adopted the motto "Large Sales and Small Profits," and believe they can best work out their salvation in this way. If this be so, mills with large capacity will be built which will adopt the best improved machinery and systems possible for men to invent and devise, and locate at points where power can be secured at a nominal price, where ample facilities will be provided for shipping the wheat as well as the flour at the best rates. Closer yields with a larger per cent. of high grade and a lower per cent. of low grade are desirable and many are of the opinion that better results can be accomplished in this direction. If the yields reported are correct, the average amount of wheat per barrel for winter wheat is too high. From the best information I could gather, the range of yields for Michigan mills is large, the lowest being 4 bus. and 24 lbs. per bbl. to 4 bus. and 47 lbs. per bbl.

If there is any one thing about which millers do not care to talk, it is about the amount of wheat they use to

make a barrel of flour, therefore it is very difficult to gather statistics in this branch of milling, and anyone who has ever made the effort will certainly sympathize with others who have also made the attempt. I am satisfied, however, that the yield can be improved in many mills. Of course local causes may have something to do with it as well as the mill and the miller. There is no trouble in making good flour if the miller has good wheat, and he takes 4 bushels and 40 lbs. to make a barrel of flour. It is evident to any one at all familiar with the present prices of wheat and flour, that the mill which takes such an amount of wheat to the barrel will not make money. It requires skill, intelligence, and close watchfulness of the most minute details of the mill to make the average yield of the mill 4 bus. and 24 lbs., and we are told by many milling experts, that this can not be done. Others are of the opinion however, that it can be done and is accomplished with percentages about as follows: 25 per cent. of first patent, 65 per cent. of second patent, 7 per cent. of first low grade and 3 per cent. of second low grade. The flour of the mill making this yield stands as well in the markets where sold as the flour of other mills milling the same class of wheat which report 4 bus. and 32 lbs. These results cannot be attained in every mill because all mills are not built with the idea of close yields and good flour; for many are built with a lack of capacity in some of their parts and unless the proper remedies are applied, this shortcoming is sure to make inroads on the vitals of the bank account and financial death is apt to follow. It is estimated that there is about 53 lbs. of flour material in a bushel of measured wheat which will weigh 61 lbs. to the bushel. By a careful estimate and experiment made, the average of the outer coating of the wheat berry is about 3.45 per cent., of the bran 7.45 per cent., of the germs 2.58 per cent., of the floury portion 86.52 per cent. The floury portion is not all first patent, or indeed second patent, but there is a larger per cent. of these than with their present methods of milling is made from the wheat in many mills. It is evident to any one who has given this subject considerable thought, that we shall be obliged to work out our salvation by taking into account these several factors.

There are two important principles of trade which our millers should understand before they can achieve the success desired.

First, our millers must make flour so much superior to that made by our foreign competitors, that buyers will be glad to pay us the same price, they now pay to European millers.

Second, our millers must apply such knowledge and skill to milling that such superior flour can be made without an increase in the cost of production.

SPONTANEOUS COMBUSTION.

IN 1883 the question of spontaneous combustion was brought to our attention by the sweepings from the floor of our factory developing an alarming increase in heat when placed in heaps. The floor had been sprinkled and the sweepings were moist. During the afternoon they began to heat, and the thermometer placed in the pile, after it had been disturbed, indicated about 200° F. It being time to close the factory for the night the sweepings were thrown out.

One day during the next year a peculiar odor was noticed in the factory, which increased and became very unpleasant. This was found to emanate from a barrel of shavings and chips from the boring and mortising machines. These shavings and chips are removed from the throats of our plane stocks, which are previously saturated with warm linseed oil. When the cover was removed from the barrel the fumes were quite strong; the shavings were so hot that the hand could not be held in them without being burnt. The barrel was removed to a vacant lot, covered with an oilcloth and left. That night, during a heavy storm, the cover was blown off and the shavings wet. The kept hot a long time, but did not char. We then directed the removal from the building of all shavings and sawdust made from oiled wood as soon as made.

During one day last year we had been sawing the oiled plane stocks, and at night, when removing the box under the saw containing the sawdust that had fallen into it during the day, it was noticed to be very hot. It was placed at a safe distance from the building, and in the morning the sawdust was burning. A light misty rain had set in during the night. The fire was extinguished, but the rain continued and increased. Before noon the dust was burning again.

During the month of June last we were planing our oiled stocks on hand (or buzz) planer, and (on June 10) filled four sugar barrels with the shavings. Water had been spilt on some of the shavings that were put in one of the barrels and the shavings soon began to heat. A

thermometer placed in among these shavings indicated a rapidly rising temperature, and at 6 p. m., of the next day the shavings at the top of the barrel began to char. There were then placed outdoors under a wrought iron boiler bonnet, and covered with a metal plate, we found that the shavings were charred and had shrunk into a cylinder-shaped mass, with a 3-inch space between it and the sides of the barrel, making the shrinkage six inches across the top. Upon disturbing the mass it broke into flames. Later in the day sawdust (from oiled becco wood) that had been deposited in a box as it left the saw the day before, began to burn, setting fire to the pine box containing the dust. The box, with the dust, had been placed in an old iron smokestack lying upon the ground at a distance from the building.—[Gage Tool Company, Vineland, N. J.]

LONG-DISTANCE CABLE TRANSMISSION.

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

CHANGING THE GRAIN STANDARDS.

THE Inland Revenue Department has submitted to the various Canadian Boards of Trade the following amendments which it is proposed to make in the Grain Inspection Act:

Paragraph 1, referring to extra Manitoba hard wheat, retains 85 per cent. of red Fyfe as its standard, but is amended by inserting the word "hard" before "red Fyfe." A similar amendment appears on the standard for No. 1 Manitoba hard wheat, which must be 60 lbs. to the bushel, and composed of at least two-thirds of hard red Fyfe wheat.

No. 2 Manitoba hard wheat is retained at 58 lbs. to the bushel, composed of at least two-thirds of hard red Fyfe wheat. The next paragraph reads as follows:

No. 1 hard white Fyfe wheat shall be sound and well cleaned, weighing not less than 60 lbs. to the bushel, and shall be composed of not less than 60 per cent. of hard white Fyfe wheat grown in Manitoba or the North-West Territories of Canada, and shall not contain more than 25 per cent. of soft wheat.

Another amendment clause reads:

No. 1 Manitoba Northern wheat shall be sound and well cleaned, weighing not less than 60 lbs. to the bushel, and shall be composed of at least 50 per cent. of hard red Fyfe wheat grown in Manitoba or the North-West Territories of Canada.

A further amendment reads:

No. 2 Manitoba Northern wheat shall be sound and reasonably clean, of good milling qualities and fit for warehousing, weighing not less than 58 pounds to the bushel, and shall be composed of at least fifty per cent. of hard red Fyfe wheat, grown in Manitoba or the North-West Territories of Canada.

After speaking of the grading of winter wheat, Indian corn, oats and barley, the following is added:

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

In the provisions as to all the grain the following is added:

No wheat or other grain that has been subject to scouring or treatment by the use of lime or sulphur, shall be graded higher than No. 3. Samples furnished to inspectors shall be made to conform as strictly as possible to the conditions and terms specified in the foregoing classifications. The above modification shall not come into force until the 1st of September, 1888.

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"BLENDING" FLOUR AS A NEW INDUSTRY.

THE New York *Commercial Bulletin* says:—There has been started within the past year a new industry in the flour trade in this city, known as the blending of different grades and kinds of flour, by which the better qualities in all are combined and the low grades raised and improved. This is known as the blending process, and it was introduced into the market first, because here are to be found in the greatest variety and abundance all the different grades of flour produced from all the different kinds of wheat from every section in the United States east of the Rocky Mountains. This process was introduced here by Mr. Kirk, formerly a miller of St. Louis. It is not claimed that this is a new process in the sense that the patent or roller process was new; but it is a new process of mixing or blending flours made from different kinds of wheat. This has been only partially and imperfectly done in the grain hitherto by flour mills of both the old and new process. No two kinds of wheat can be ground together and the flour blended perfectly at the same time and by the same process. Millers only blend their flour by mixing their wheat before grinding, and hence the best results have never been attained by them. Under the old stone process every miller had to change the rig of his mill whenever he changed the character of the wheat he was grinding. So must the roller process mills be rigged differently for different wheats. But neither have adopted the only plan by which the flour of different wheats can be properly and perfectly blended, and hence the best results obtained.

That can only be done by grinding, separating, bolting and finishing each kind of flour separately first, and by mixing the flour perfectly afterwards, instead of the wheat. Thus, by long experimenting, a system has been arrived at by which any kind of flour can be improved by this process, from the highest to the lowest. It is found, for instance, that one-third Winter and two-thirds Spring wheat patent makes a better flour than can be made from either Winter or Spring wheat alone. But it is thought that even this proportion might be improved upon by making the proportion half and half for family uses; only the bakers, who use a larger proportion of patents now than anything else, prefer the greater part Spring because of its greater power of absorbing water in making bread, by which a barrel of spring wheat flour will make about 2 pounds or loaves more of bread to the barrel than winter patents, which are not so strong as the spring, having more gluten in the wheat, and the winter more starch.

For this reason the lower or shipping grades, it is claimed, can be improved even more by the process as well as the flour itself. In the low grades the colour is an important matter, as it is naturally darker than the high grades, and by this they are in part designated by the buyer. Hence any thing that will raise the color of the same quality of flour will raise its value also. If some miller has shipped to this market some flour for a certain grade which does not take upon arrival and inspection, it is bought and blended with enough of a better grade to bring it up to the standard of that grade and make it go on contract; or, *vice versa*, if a shipment proves to be above the grade, and not quite up to the next higher, it can be reduced to the standard, and thus get the advantage of the better quality. There is still another advantage. When a certain grade of flour becomes scarce in this market, and is wanted for immediate shipment or home use we can buy a grade or two above and as much more of a grade or two below, and blend them in the proper proportions to make the standard of the grade required, and can thus supply a demand that otherwise could not be filled, and which would go to another market. In this way can be made all of the intermediate grades between the highest and the lowest, and supply to any market in the world.

The advantages of this process in an export market like New York, which ships to Europe, the Provinces South America and the West Indies, are obvious. In Mr. Kirk's opinion "the time will come when the process will be in as general use as the roller process has become. But instead of its being done by outside parties, it will be done by the millers themselves, who will have two or more separate mills in one in which to grind the different kinds of wheat separately, and then blend the flours after they are finished, as done now. In fact there are already two large mills in the West—one in Cincinnati and the other in St. Louis—which have done so, and although the flour is not yet as well known, it is superior to the best patent Minnesota that comes to this market, or ever was made. This change will be forced upon all the large millers in the country until the blending of winter and spring flours will become as general as the patent or roller flour process now is, be-

cause the flour thus produced will be as much superior to the patents as they are to the old straights. "With every year," said he, "the milling of wheat is being more and more improved, until it will eventually be reduced to a scientific basis, instead of the experimental one upon which each miller has conducted it according to his individual experience and skill, or that of his miller. Even now," said he, "most of the large mills employ an expert to see that the proper machinery is in use, and that it runs properly and with the least cost of water power and waste, and also to see that nothing goes to waste about the mills, and that the wheat of different kinds is milled to the best advantage, as well as that it is separated into the different grades of flour in the most economical manner."

FIRE PROTECTION FOR FLOURING MILLS.

DOUBTLESS the average mill construction, as viewed from the insurance standpoint, is far from being perfect. That it will gradually improve and approach more nearly to the highest insurance standard is probable and to be hoped for. The problem for the owner of an old mill to solve, says the *Milling Engineer*, is not how to build a new mill so as to conform to insurance requirement, but how to get insurance for his present mill at as low a cost as possible. In other words, it is insurance and not indemnity that he is looking for, and for insurance at reasonable figures. It will therefore pay the owner of any mill to look after the little details in the present construction of his mill, trifling changes in which may lower the rate. A brick fire wall between engine room and mill is, in many cases, most conspicuous by its absence. It would cost but little, in comparison with the sum represented by the interest paid as extra insurance on account of the higher rate due to its non-existence. So in the matter of stand-pipe and hose. A little expenditure in this direction will, in many cases, result in a reduced rate. The mill owners should not, however, make the common mistake of putting in appliances of this kind entirely inadequate to the purpose intended. We have seen in more than one mill stand-pipes only 1½" to 1¾" diameter, with a length of common ¾" garden hose on each floor. This may do to amuse the boys with when new, but is of small account when fighting an incipient fire, no matter how insignificant. Nor is it much better to put in stand-pipe and hose ample in size and couple them to a boiler feed pump or other source of insufficient water supply. In one case that has come under our observation, the stand-pipe and hose were even larger than the insurance companies specify and the fire pump was ample. When all in place, it was found that the water supply was insufficient to keep the pump at work more than two or three minutes. The large pump was taken out and the stand-pipe coupled to the boiler feed pump. Such protection as this is scarcely worth the name. The mill owner should consider that the purpose of such devices is primarily to put out fires, and the reduction of insurance rates is a secondary matter.

From Mr. S. H. Seamans, secretary of two of the mutual companies which write insurance on flour mill property, we have obtained the following regarding fire protection for flouring mills:

"Mutual companies require casks of salted water, with two fire pails to each cask, on all floors above the first, in mills which they insure. Many companies require stand-pipe and hose, and all companies make a rebate on insurance charge for such facilities of 10 to 25 cents in rate. The stand pipe should be of not less than 2½" in diameter, and it is desirable, by means of lateral pipes, to have several hose communications on each floor. The hose should be 1½" rubber lined cotton hose, not more than 50 feet in length, and have nozzle attached ready for use, the whole connected with stand-pipe and supported by good swinging rack. Hose of this light weight is much more effective than the heavy 2½" rubber hose in general use, as one man can easily handle it, while to properly handle the larger size it requires two or more men. The heavy hose is generally coiled, and is liable to crack and become useless when needed, but with short lengths of light hose, hung on swinging racks, no such trouble can occur.

"Mutual companies are also the first and strongest advocates of the use of automatic sprinklers in flouring mills, and for such sprinklers, properly put in and approved, make a uniform reduction of 25 per cent. from rate before so protected. To obtain such reduction it is necessary to have two sources of water supply for the pipes and to have supply pipes of sufficient capacity to maintain a good pressure in pipes in case many sprinkler heads are open at once.

"Great care should be taken to see that all work is done in a proper manner and that false economy does not induce the use of supply pipes of small capacity.

FLOUR AND OATMEAL MILLING IN PRINCE EDWARD ISLAND.

NOW that we have a flour mill of considerable capacity, says the Charlottown, P. E. I., *Patriot*, that can turn out an excellent article for family use, our farmers should venture to sow more wheat. Sometimes the late sown grain escapes the weevil best, and if the season be favorable otherwise the wheat is a good crop. As the price of flour is advancing in the west, and the rise is immediately felt here, it seems to us that our farmers would do well to sow a larger acreage of wheat than has been customary in late years.

Some of our contemporaries have been urging the erection of mills on the Island to manufacture oatmeal. There are such mills in the Province. As good oatmeal can be bought in our market as can be manufactured in any part of the world; and if the demand were only greater we are sure their owners would be only too glad to increase their capacity. But the Ontario mills are formidable competitors; this year, of course, owing to the short oat crop in Western Canada, the price is higher than usual. A failure in the grain crop in Ontario, however, is a rare occurrence, and it would not do to undertake a large increase in oatmeal manufacture from the opening offered by merely one year's demand. But apart from the experience of last year, we must say that we can see no good reason why we cannot compete at any time with Ontario in the manufacture of oatmeal. The Island produces as good oats as can be seen anywhere. We have water-power; and owing to the short distance we have to transport coal, we can have cheap steam power. All that is required, then, is capital and enterprise to develop the oat milling business sufficiently to consume all the oats raised on the Island, not required for other purposes.

The want of winter communication is no doubt against the oatmeal manufacturing interests. Oats are bought and rushed off early before the close of navigation, in order to get a speedy return for the crop. The oat mills already in operation are able to meet home consumption; so that any large mill, working all winter, would necessarily accumulate a large stock before spring opened. The subway, or some other solution of the winter-communication problem, would give a valuable impulse to the oatmeal trade, as well as to all other lines of business.

DEFECTIVE BOILER SETTINGS.

SETTINGS may be defective from a variety of causes. They may be of defective design originally, so that, no matter how well the work of putting them in is done, they may never give satisfaction or work properly; in fact, they may be dangerous from the day they are started up, although the brickwork may be in first-class shape. Among settings of this class may be mentioned all those having a free communication between the furnace and the top of the boiler. Another form, but one which is not necessarily dangerous while the brick work is in good order, is that where a flue is carried back over the top of the boiler-shell. As often pointed out, trouble from this form generally arises from distortion of the walls whereby the fire takes a short cut from the furnace up the sides and down the top of the shell, without the formality of first passing under the shell and back through the tubes. Many boilers have been seriously damaged in this manner. The trouble generally occurs suddenly, so that the mischief is done before harm is suspected. It must also be conceded that where the water is bad and the right condition prevail, injury may be done to the shells of boilers with this form of setting, even when it is kept in first-class order. Other setting which may be justly considered defective in design are those which are so constructed that an abnormal quantity of air is admitted to the fire, or those where air is admitted in the wrong place. It is a settled question, and one which has been settled for years, that the admission of an unlimited quantity of air into a boiler furnace above the fire is very detrimental to economy. Still, in spite of this fact, there periodically spring up settings based on the principle that there must be an enormous quantity of air admitted above the fire or there will be most imperfect combustion, and many boiler owners are convinced by glib-tongued agents that such is the case and proceed to sink money in such traps. Any one can demonstrate its fallacy by experimenting with a common stove at home. In fact, we don't believe there is one man in a hundred but knows perfectly well that to drench the fire in his stove or furnace nothing is so effective as the admission of air above the fire; why then should it not apply equally well to a steam-boiler furnace? Experiments have demonstrated that it does.—*Locomotive*.



The Hockey shingle mill has gone up in smoke.

Mr. J. H. Hall has sold his mills at Kilworthy, Ont.

The lumber business is booming on both sides of Byng Inlet.

Messrs. Gillies Bros., are running their saw mill at White Lake night and day.

Messrs. Brown & Mahood, shingle mill operators at Utterson, Ont., have assigned.

A new water wheel has been added to increase the power at the Assesipi mills, Man.

It is said the Rainy River will send out more saw logs this season than for the last two years.

Mr. P. Browne's saw mill at East Wawanosh, Ont., recently destroyed by fire, will be rebuilt at once.

Messrs. Craigie & Son, of Penetang, are reported to be rebuilding their mill, recently destroyed by fire.

Fires in woodworking factories in the United States and Canada during April caused a loss of \$1,560,000.

The average daily cut of lumber of the Minnesota & Ontario Lumber Co., Rat Portage, Ont., is 95,000 feet.

The boiler in Blake Bros.' saw mill at Drummondville, Que., exploded recently, killing an employee named Moise Laramée.

Spruce logs are in great demand at Chatham, N. B., and prices have advanced considerably as compared with those of last year.

An addition is being made to the Rathburn Co.'s sash and door factory, Deseronto, Ont., which will be occupied by new machinery.

Messrs. Hinge & Synnett have erected a new saw mill in Erasmosa township, Ont., and have placed therein a boiler weighing 8,000 pounds.

A saw mill manufactured by Sprate & Gay, of Victoria, will be used at Rock Creek, B. C., for sawing lumber for the Laura Hydraulic Co.

Forest fires in Nova Scotia, New Brunswick and Newfoundland have destroyed a great deal of valuable property and occasioned the loss of many lives.

So great is the demand of American buyers for Canadian lumber that gangs of men are at work all night at Ottawa loading launches and barges.

The St. Catharines Lumber Company's appeal is not expected to come before the Privy Council Judicial Committee until the end of the first week in July.

A youth has been victimizing hotel-keepers and others in Western Ontario by representing himself to be the agent for a prominent Hamilton lumber firm.

While trying to disentangle a jam of logs three men were swept down the river Terra Nova, Newfoundland, over a cataract sixty feet high, and were dashed to pieces.

The immense timber raft which Mr. Robertson is now building in Nova Scotia, already contains 21,000 pieces, and it is expected that 7,000 more pieces will be required to complete it.

Messrs. Fader Bros., of Victoria, B. C., have \$20,000 worth of new machinery on the way from Ontario for the large new saw mill which they are erecting beside the present one.

The Bow River Lumber Co.'s mill, at Calgary, N. W. T., is cutting 30,000 feet of lumber per day. A drive of 3,000,000 feet, the result of last winter's work, is on its way to the mills.

The *Canada Gazette* contains an amended regulation respecting the removal of timber on Indian land by actual settlers, which requires purchasers of these lands to clear five instead of fifteen acres.

On the night of June 22nd fire destroyed the shingle mill operated by Callaghan Bros., on Sturgeon Lake, and owned by Mr. J. S. Leverich, of Port Hope. Loss, \$4,000; partially covered by insurance.

W. E. Smith, head sawyer in Mackon's mill, Highgate, Ont., was killed last week. While turning down a pulley he got his foot on the belt, was thrown against the pulley, and the chisel ran through his breast.

A fire occurred on Sunday evening, 17th June, in the piling grounds of the Lumbering and Manufacturing Company at Lakefield, Ont., by which about 750,000 feet of lumber was destroyed, worth about \$15,000.

Messrs. Jonasson, Frederickson and Walkley, Captains Robinson, Brown & Rutherford and other lumber firms in the vicinity of Lake Winnipeg, Man., took out about 5,000,000 feet of logs during the past winter.

Mr. Thos. Tait's saw mill at Germania, near Gravenhurst, Ont., was destroyed by fire on the morning of June 28th. There was also destroyed 1,500,000 feet of lumber and 100,000 shingles. Loss \$12,000; insurance \$2,000. The fire is supposed to have been started by a spark from the burner. Mr. Tait has been unfortunate in the matter of fires, having suffered loss thereby three times within the last three years.

A Montreal despatch says:—Wm. Little, Lumber dealer, who assigned a few days ago with liabilities in the vicinity of \$200,000, has filed in court a supplementary list of his creditors. Among the privileged creditors are the Crown's lands department, \$11,800, and the Federal government \$1,500. Among those who are secured are the Dundee Mortgage and Trust Investment Co., of Dundee, Scotland, \$37,420; Andrew Allen, \$20,247; H. G. Durlough & Co., Whitehall, N. Y., \$8,500. Insolvent's assets are \$115,955, consisting in lumber and timber on St. Maurice river, and lands in British Columbia, Three Rivers and other places,

The Emery Lumber Company, that lumbered in the Georgian Bay country, putting in 97,000 pieces, has got its drive down in good shape. The logs will be manufactured at Midland, Ont. Mr. Loveland, of this company, says but for the export duty of \$2 a thousand on logs the company would have rafted a considerable quantity to the American side this season.

A fatal accident occurred at Thorp's saw mill, near Mount Forest, last week, causing the death of Peter McIntyre and severe injury to John Sevil. The men were sawing lumber when the boiler burst throwing steam and hot water over the whole building. Peter McIntyre was badly scalded and died in about two hours. Mr. Sevil, though badly injured, will likely recover.

Messrs. Perley & Pattee have been advised that a serious fire is raging on their limits on the Petewawa River. The information is brought by one of the employees of the firm and the particulars are very scanty. The destruction is supposed to have been started from fires made by settlers for the purpose of clearing their land. No estimate can be formed of the probable loss, as the full extent of the fire is not known, but the limits are of the best in the lumbering districts of the Upper Ottawa.

Messrs. George Cassiday & Co., have just started in operation a new saw and door factory at Vancouver, B. C. The building is a large three storey frame structure and is fitted with the latest and most approved machinery. It is the intention to supply heat by means of steam pipes to the drying rooms from the same boiler. Nearly all the machinery is in duplicate, so there is no chance of the production of any article being stopped through a breakdown. Outside of the value of the building there is already \$12,000 worth of machinery in the factory.

The Lake Winnipeg Transportation, Lumber and Trading Co. is seeking incorporation for the purpose of carrying business on Lake Winnipeg and tributary steamers, with headquarters at Selkirk. The capital stock is placed at \$40,000. The applicants are:—S. Jonasson, Winnipeg; F. Frederickson, Glenboro; James Walkley, St. Clements; T. H. Smith, Springfield; Norman Matheson, Kildonan; F. W. Coleleugh and W. H. Eaton, Selkirk.

The following advertisement appeared in the *Ulster County Gazette*, of Kingston, N. Y., for May, 1800:

FOR SALE—ONE-HALF OF A SAW MILL, WITH A convenient place for building; lying in the town of Rochester. By the mill is an inexhaustible quantity of pine wood, and also a stout, healthy and active negro wench. Any person inclined to purchase may know the particulars by applying to JOHN SCHOO-MARER, JUN., at Rochester. November 13, 1799.

Our Pacific coast contemporary, the *California Architect*, is waging war against the lumber rings through whose operations it says the price of lumber is much higher than it would be if the demand governed the price. Our contemporary shows that building operations in San Francisco will fall far short of former years owing to the impossibility of getting lumber at a fair value. The *Architect* would very much like to see the import duty removed, which would allow supplies of British Columbia lumber to be brought into California and sold in competition with stocks held by the lumber "trusts."

The Ottawa correspondent of the *New York Lumber Trades journal* writes:—All the mills here will be running night and day soon, and as there is a large supply of logs over from last year and new stock well on the way to the mills, this will be a very busy season. Lumber is being shipped very rapidly both by rail and water, but I am informed that the demand for the better grades is not up to expectation, the reason assigned being the large quantities of Whitewood which have come into competition in your markets with good pine for house finishing and other purposes.

A Michigan shingle manufacturer, in speaking of 18-inch shingles, states that while they are now commanding a fair price, he thinks there will be a decline in a short time on account of the Canadian competition. The "Canucks" have seen the opening and have commenced to manufacture an 18-inch shingle, and put it into the eastern States, paying the duty, and easily competing with Michigan shingle dealers. Stumpage and labor are cheaper in Canada, and in some instances stock is better. For these reasons the Canadian dealer can pay the duty and run his Yankee competitor up a tree.

Since the opening of navigation, says the *Timberman*, there has been a continuous running back and forward between this country and Canada, of capitalists in quest of pine. The Spanish river country has been honored recently by the presence of Messrs. George Simpson, of Evanston, Ill.; Jas. S. Smith, of the Chipewa Lumber & Boom Company, Eau Claire, Wis.; L. H. Brown, Buffalo, N. Y., and Chas. Marthinson, of Grand Rapids, Mich., and rumor has it that these gentlemen are acting in concert in the purchase of a big tract of pine—a purchase involving an outlay of half a million of dollars. The Spanish river pine is said to be large, and of fine quality, and will doubtless bring a good price in the stump from this time forward. Several Minnesota operators are said to be at the present time negotiating for a round block of pine on the Spanish river.

Ottawa advices state that the sawdust question is temporarily settled. The report of one of the Government engineers condemning the deposit of sawdust in the Ottawa from the Ottawa lumber mills as most injurious to the river, filling up its channel, killing the fish and leaving decaying deposits dangerous to health on the shores. The lumber firms here, who say it would cost half a million to reconstruct their mills so as to burn the sawdust, protested that the report was biased, and asked the government to join with them in appointing an independent commission of engineers to go into the whole question. The Government and the lumbermen were each to appoint an engineer, and these two to select a third. The Government was agreeable, but it proved difficult to get the engineers. The lumbermen nominated Mr. Kennedy, harbor engineer, of Montreal, but he was unable to act, and then Major Perley, the Government engineer, who was nominated, declined to act with the other men suggested by the lumbermen. Finally it was suggested that the whole matter be put into the hands of Mr. Sanford Fleming. Mr. Fleming has

consented to act, and his report will settle whether the lumbermen shall continue to use the river as a dumping ground for sawdust. The leading lumbermen threatened to move their mills from Ottawa if the question is decided against them, as they say it will pay them better to move the mills further down the river than to reconstruct them here. The moving of the mills would lessen Ottawa's population by three or four thousand souls.

The Longford Lumber Co., of Longford Mills, Ont., write as follows to the *Northwestern Lumberman*: "Our company this season has taken out its usual stock of logs, about 17,000,000 feet. We found last winter to be one of the best for taking out stock, there being continual steady cold weather. Fears were entertained early that the supply of water for driving would be short, but on account of the dull backward spring the water in our streams has held up well, and our drives are fully one month ahead of other seasons. Our three mills started running about May 1, and so far our stock is coming out fully up to the average, both in quality and manufacture. The demand for dry lumber is good, many lines being already cleared out of our yards, a large portion going to Boston by all rail route. We are anxiously waiting the action of congress on the tariff question, and we presume our neighbors must be in the same mood, as we have not seen reports of many sales of the new cuts."

In the address of President Darling at the annual meeting of the Canadian Bank of Commerce, the condition of the lumber trade is thus stated:—"The largest interest the bank has in is the shape of loans to lumber merchants. The winter before last was unfavorable for lumbering operations, and the drought in the ensuing summer prevented a considerable amount of logs reaching the mills, and also was the cause of many bush fires. The fires forced some of our customers to increase their cut for the winter immediately past. This last winter, however, has been a most favorable one for operations in the woods; there has been no difficulty in respect to driving the logs and an ample supply will reach the mills. The demand for lumber has been, and still is, very good; sales covering most of the season's cut have already been made by many mills, and as the price has been steadily maintained, a very large and profitable business may be regarded as assured to the millers this summer. As most of the cut is sold in the United States, either for cash, or on time to houses of very high standing, the marketing of this, our most important product, is always readily accomplished. If anything were needed to demonstrate the great value of our forests, the prices recently paid for limits at the sale by the Ontario Government, and the prices at which many other limits have changed hands during the year, should remove all doubt. There may come a time when the values of limits will be over-estimated, but if bankers make their advances only for the purpose of manufacturing lumber, and see that these advances are cleared up once in each year, the business should continue to be as highly satisfactory as it has been for some years past."



It is stated that the Crossen Car Works are to be removed from Cobourg to Toronto.

The Rathburn Co., of Deseronto, will, it is said, engage in the manufacture of charcoal iron.

A new engine is to furnish power to the machine shops of the Rathburn Co., Deseronto, Ont.

It is said the management of the C. P. R. have decided to remove their workshops from Winnipeg to Thunder Bay.

Work on A. Harris, Son & Co.'s new foundry at Brantford, is at a standstill owing to a strike on the part of workmen.

The machinery for the new saw mill of Mr. D. J. McLaughlin, at Pallet River, N. B., is being supplied by Messrs. Allan Bros., of Carleton, N. B.

The establishment of rolling and water pipe mills at London is talked of in case the present attempt to find natural gas should prove successful.

Railway trains in England are now driven at an average speed 14 per cent. higher than twenty years ago, with scarcely more than half the quantity of coal.

The by-law granting D. H. Hill, of Tilbury Centre, \$6,000 to remove his manufactory from that place to St. Thomas, was carried by a large majority.

The Ontario Government has an engineer and surveyor engaged in making an examination of the water which might be made available for manufacturing purposes at Sault Ste Marie, Ont.

The Montreal Car Wheel Co. are erecting works at Lachine, in which manufacturing will begin about the 1st of August. Mr. D. H. Gilbert, late of the St. Thomas Car Wheel Co., will superintend the business.

The Norton Manufacturing Co., of Ingersoll, have caused a writ to be issued against the Patterson & Bro. Co., of Woodstock, claiming \$50,000 damages on account of alleged untrue statements contained in a circular circulated by the latter firm regarding a certain machine manufactured by the Norton Co.

The mechanical schools of the country are doing good work in one direction, viz., in exciting a greater interest in testing materials of engineering and manufacture. And in many instances they are affording opportunities for manufacturers to have materials tested at a small cost. There is a good field for them to work in this last named direction. Such schools can afford to do this work at low cost, because it is excellent exercise for students in an educational direction. And doing it, while it will not interfere with any established business, will undoubtedly foster the habit of testing of materials, to the end of getting a better knowledge of what is being used in construction.—*American Machinist*.

BOFOR'S STEEL CAST GUNS.

The Bofor Works, Sweden, are now prepared to produce ordnance up to 17 feet, which according to exhaustive tests, made by the Swedish government, are fully equal to the product of Krupp's works and at very much less cost.

The Bofor metal is open hearth steel, made from the best Swedish ores with charcoal fuel. This steel is cast without blow holes by the introduction of silicon and manganese in proper quantity just before casting. At this stage the metal is crystalline and does not possess tenacity, elasticity and ductility to a sufficiently high degree. These qualities are obtained in the after treatment. The cast block is reheated and then buried in pulverized cinders until completely cooled. After being roughbored and finished, it is again heated and oil tempered, and is again annealed. It is then ready for finishing.

WANTED

SITUATION in the grain and flour trade, as traveller, bookkeeper, or would be willing to be generally useful, by a young man with nine years' experience. First-class references and can give security if required. Address "J. D." care of DOMINION MECHANICAL AND MILLING NEWS, Toronto.

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Designs, Plans and Specifications prepared for all class of buildings. Tenders obtained, and buildings superintended in any part of the province. Having had a large experience in the construction of Grain Elevators and Mills, we are in a position to supply working plans, etc., for these buildings, and the necessary machinery for any capacity on the shortest notice. Correspondence solicited. No charge for preliminary designs.

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The Agency will forward at least once in three months, or oftener if desired, a report and statement of all accounts in hand. NOTE.—The offices of the Agency are open to the Solicitors and subscribers for reference to our numerous mart, salaried, directors, and correspondents, and for the transaction of business with their clients and customers whom in Toronto.

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FOR SALE.

SAW and grist mill machinery for sale by H. W. PETRIE, Brantford, Ont.

ONE small grist or choppin' mill with power, in good locality.

ONE pair 62 inch burr stones with parts.

ONE 30 inch portable burr mill.

ONE 20 inch Waterous burr chopper.

3 corn shellers by different makers.

ONE 60 in. Tyler water wheel in scroll case.

48 inch leffel, with the sun.

48 inch scater wheel, new.

48 inch Tyler wheel in iron case.

TWO 42 inch Sampson water wheels.

40 inch leffel water wheel, with the sun.

35 inch leffel wheel, left hand.

30 1/2 in. leffel wheel, left hand.

30 inch Burnham, a fine wheel.

26 inch leffel, runs against the sun.

20 inch leffel, with the sun.

17 1/2 inch leffel, runs with the sun.

15 inch Archimedian, in iron case, left hand.

13 1/2 inch leffel wheel, against the sun.

ONE water wheel governor, Galt make.

4 head block saw mill, iron saw frame. Waterous make.

2 block saw mill, Waterous make.

4 lath mills, new and second hand.

8 shingle machines, different kinds and makes.

2 stave cutters.

ONE heading turner.

2 spoke and axe handle lathes.

5 drag sawing machines.

12 shingle jointers.

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NO. 5 sturtevant exhaust fan.

LOT of bevel and spur gears. Send for descriptive lists.

ONE foot stave jointer.

CIRCULAR saws, 66, 60, 55, 52 and 40 inch, and several smaller sizes.

LOT of lumber and log cars.

SEND for my descriptive lists of engines, boilers iron tools, wood working machinery, &c. H. W. PETRIE, Brantford.

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BECKETT ENGINE CO., HAMILTON, for automatic engines.

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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 Gate Barbo's grates, manufactured under patent by Beckett Engine Co., Hamilton, Ont.; from twenty to twenty-five per cent. saving according to treatment.

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

LUMBER PRICES.

CAN OR CARGO LOTS.

Table listing lumber prices for various types of wood and sizes, including clear picks, dressing and better, and various shingles.

YARD QUOTATIONS.

Table listing yard quotations for mill cull boards, shipping cull boards, and various types of lumber.

Table listing Montreal prices for various types of lumber, including ash, birch, and maple.

MONTREAL PRICES.

Table listing Montreal prices for various types of lumber, including ash, birch, and maple.

ST. JOHN, N. B.

Table listing St. John, N.B. prices for various types of lumber, including spruce and pine.

NEW YORK PRICES.

Table listing New York prices for various types of lumber, including white pine and eastern spruce.

Table listing shingles prices for various sizes and types, including pine and cedar.

Table listing hemlock prices for various sizes and types.

Table listing dressed lumber prices for various sizes and types.

Table listing Albany, N.Y. prices for shingles and lath.

Table listing hemlock prices for various sizes and types.

Table listing pine prices for various sizes and types.

Table listing various lumber prices for different sizes and types, including shingles and lath.

BUFFALO AND TONAWANDA PRICES.

Table listing Buffalo and Tonawanda prices for various types of lumber.

WHITE PINE—ROUGH.

Table listing white pine prices for various sizes and types.

DRESSED LUMBER.

Table listing dressed lumber prices for various sizes and types.

Steam Department.

FORCED DRAUGHT FOR BOILERS.

BY GEO. C. ROHL.

ATTENTION has recently been given to the use of forced draught for Marine boilers. It has been applied under a variety of conditions and for different purposes. In some cases, such as in war vessels, the great object aimed at was to get an increase of power when necessary; in other cases the more commercial view of the matter was taken, and while increased power was not overlooked, economy of space and of fuel were the great points to be attained.

Two distinct methods have been tried, the one of forcing air into a closed stokehold so that the men who worked the boilers were under an increased atmospheric pressure; the other, where the air was forced through pipes and applied directly to the boilers. The first plan has been used mainly in war vessels, torpedo boats and such like, and it is alleged has produced such serious results in the way of leaky tubes and joints about the boilers as to make it really a detriment instead of a benefit.

The other system has produced very satisfactory results when adjusted to suit the fuel used, and other conditions; for experiments have clearly shown that the forced draught which under certain conditions gave no good results under other conditions effected a large saving.

Mr. Hawden, of Glasgow has patented certain arrangements for applying forced draught to marine boilers, and in actual practice has obtained excellent results.

In this country forced draught has frequently been used, but nearly always for the purpose of using some kind of cheaper fuel, such as hard coal screenings, and the usual manner of applying it has led to the fire burning so very unevenly, that while one part of the boiler was exposed to a jet of flame and hot gases, which came out at intervals over the grate as if from miniature volcanoes, other parts were exposed to streams of cold air; common effect of which was leakage at the seams or rivets. The reason of this is, that the air is supplied under the grates only, and at a pressure which has no very definite relation to the depth of fire carried on the grates, and is strong enough to carry with it quantities of the small particles of coal and deposit them in the flues or tubes.

In the marine boilers which have given the best results, air is forced under the grates, and over the fire as well. In some cases, through the furnace doors, at several points in the sides of the furnaces, and at the back of the bridge wall, and great care is taken to have the fire burn evenly over the whole surface of the grates and not in spots only. The air is carried in pipes through or around the smoke box, and lower parts of chimney, so that by the time it is delivered at the grates it is heated.

Ordinary coal can be more economically burned by forced draught arranged as described, than by natural chimney draught. The coal is more thoroughly consumed and there is very much less smoke. Of course the power required to drive the fan must be charged against any apparent saving, and there must be some means of getting up steam to start the blowing apparatus.

When using a forced draught less air space should be made between the grate bars, than for natural draught. Some carefully conducted experiments showed that about one-seventh of the total grate surface was sufficient for air space between the bars, with an air pressure a little less than four-tenths of an inch of water. The air required over the grates is to some extent dependent upon the kind of coal, but the openings may be about one-twentieth of the openings through the bars, and should be distributed as much as possible and enter through perforations about five-eighths of an inch diameter. Perforated iron plates or bricks should be used. Even in burning hard coal screenings it will be found beneficial to bring air in over the fire, and have it distributed as evenly as can be done over the fuel.

With a forced draught the temperatures of the chimney may be reduced a good deal. Heat is the source of power, and is as valuable as the money that bought the coals, yet an enormous percentage of it is allowed to slip away without giving any return in the form of work done. Any heat that while escaping up the chimney can be recovered and sent back into the furnace is clear gain, hence in using a forced draught the air pipes should always be so arranged that the air will be heated by the escaping gases, after they have left the boiler, and can do no more in the way of steam making.

Mr. Howden's system has been no use in the S. S.

New York City, running between the West Indies and parts in South America, since October, 1884. In another vessel the S. S. Celtic, which had twelve boilers used with ordinary chimney draught, ten of the same boilers fitted with forced draughts gave 15 per cent. more power than had been obtained from the twelve boilers.

The points deserving attention are, that seemingly less fuel and smaller boilers and chimneys will do the same amount of work, under a properly arranged forced draught than can be got from larger ones by natural draught, cheaper to erect and cheaper to use, and on board ship less space occupied and less weight to carry. If such advantages have already been attained greater things may be expected, and if good on board ship, why not on land, especially in crowded cities, where space is valuable and smoke is a nuisance?

THE INDICATOR, ITS USES AND USEFULNESS.

THE indicator, though of good old age, is still in the prime of its usefulness, and is still recognized as one of the most useful and reliable instruments in steam engine practice and manipulation. In general design it is the same as of old, all improvements being in the direction of detailed efficiency and delicacy of operation. The work done is the same as of old, but it is done more delicately and with greater precision. The result of its work when applied to a steam engine is the complete showing of the pressures within the cylinder to which the piston is exposed during its movement to and fro to turn the engine crank. It presents a diagram which to the experienced eye, while only indicating the pressures at different portions of the stroke of the piston, displays the actual working condition of the engine whether it be good or bad; it displays the points where improvements in the valve motion can be made as well as defining the pressures and power required to accomplish the movement of the engine in doing its work whether it be great or small.

The usefulness of the indicator is not confined, however, to the cylinder alone; it may be applied to the steam chest, to the steam pipe, to the exhaust pipe, and actual condition of pressure or non-pressure of steam contained determined in all these localities.

When applied to the steam pipe it defines and shows the fluctuations from a steady boiler pressure, and similarly so when applied to the chest, showing the condition and capacity of the several steam passages, and we may also say obstructions to effect the smooth or steady movement of the engine. If the ports be too large and the movement of steam be quicker than the chest capacity or diameter of steam pipe can supply, the indicator, when applied to the pipes or chest will show, by the shape and appearance of the diagram produced, that the demand for steam by the cylinder is considerably greater than can be supplied through the chest or supply pipe. If the steam pipe be too small the noted expansion takes place in the chest and is due to the lack of supply; if the steam pipe be large enough and the chest be too small the expansion takes place likewise in the chest, and in both cases results in a less initial pressure supplied to the cylinder than that recorded at the boiler.

If again the ports be too small or be narrow, and present great friction area, the pressure, although up to its full standard in the steam pipe and chest, is materially reduced in its passage to and operation within the cylinder. To ascertain whether any one and which of these defects exist in an engine it will be necessary to take indications of the state of things within each locality, the steam pipe, the chest and the cylinder, and a comparison being made, the condition and efficiency of the engine may in most cases be ascertained and clearly pointed out. An indication taken at the exhaust pipe or passage, while not so valuable in its presentations, often outlines conditions not clearly outlined in the cylinder card; they will define the working of the condenser if any be used, or of the exhaust pipe, a low pressure spring being inserted in the instrument, the defects will be made more apparent than in the high pressure card of the cylinder.

In addition to the knowledge of the condition and proportioning of the several steam passages, there is often a demand to know the local requirements for motion of the detail parts or portions of the engine. These can often be ascertained by relieving the engine of all work and of some of its parts, and ascertaining through the indicator the power required to effect the movement of those remaining, and from such information arriving at possible conclusions, which will improve the working of the engine as a whole and suggest means for developing the required power. Some objection may be raised against such possible conclusions and strictly accurate information may be demanded and, forsooth, insisted upon, upon the same principle

as hearsay evidence is often objected to; but must we put up with an unimproved engine, or with one the defects of which are apparent but not remedied, because such improvements or remedies cannot be strictly based upon undisputed or undisputable facts.

There are certain points of direct information presented in all indicator diagrams; there are also others to be derived by inference, calculation and comparison that are infinitely more valuable than the direct information; all must be taken advantage of wherever possible to the final improvement and perfection of the engine.

Precise information as to the power absorbed by the engine in overcoming its own resistance to motion or that of its several operating parts cannot be had. An engine running without a load does not turn over under the same conditions of force pressure and resistance as it does with a load, hence no card or diagram can be taken that will show the varying power required to overcome the friction of the engine under varying conditions of load and operation. But because we cannot have the exact and precise information leading it is not at all advisable to throw out as useless all information leading to approximate estimate of faults, defects, or good features, and designing our engines to suit such approximate information. What has appeared often to be the most accurate information has quite as often been proved unqualifiedly false. What was once the best engine on the market is now among the ordinaries, and yet the semi-accurate and semi-valuable information derived from the indicator diagram has been the basis upon which a majority of such improvement has been effected.—*American Engineer.*

PERSONAL.

Mr. Chas. J. Becker, of the Deseronto flour mills, attended the Millers' National convention at Buffalo.

Mr. James M. Horn, late of the Erin roller mills, has rented Mr. James Huxtable's mill at Horning's Mills, Ont.

Mr. Richard Kivington, of Carp, Ont., recently had three of his fingers badly mangled by a circular saw in Carruther's mill.

Mr. A. Williams, proprietor of the new saw mill at Kinloss, was severely wounded in the hand recently, while working near the edging saw.

Mr. John Kingford, one of the English delegates to the recent millers' convention, at Buffalo, spent a few days with friends at Lindsay, Ont.

A young man from Three Rivers, an employee in Haptiste Bros.' mills at Calumet, lost the fingers of one of his hands by coming in contact with a circular saw.

Wm. Smith, proprietor of the Beaverton foundry, has left for a two or three months trip to England, Scotland and Ireland. He will visit the big fair at Glasgow.

Mr. A. McLaughlin, foreman at the Osborn-Killey Company's works, Hamilton, has severed his connection with that company to take a similar position in Toronto.

Mr. D. W. Patton, a miller employed in the Classic mills, Stratford, Ont., had his right hand caught between the belt and the pulley on one of the break rolls, and badly crushed, a week or two ago.

Mr. Archibald Campbell, the well-known Chatham miller, is finding out that the path of the politician is not a smooth one. Mr. Campbell's second election to the House of Commons is to be contested on the ground of corrupt practices.

Mr. John Wilson, head sawyer in Fould's mill, at Hastings, Ont., recently had two fingers amputated by a circular saw. Twenty years ago, while in the employ of the same firm, he lost all the fingers of his right hand in like manner.

Mr. A. B. Mennie, who operates a flour mill at Kentville, N. S., paid the MECHANICAL AND MILLING NEWS a visit the other day. He has been revisiting relatives and friends in Ontario after an absence of sixteen years, and is able to testify to the progress which this part of the Dominion is making.

A St. Thomas young lady named Miss Sabastian, went into May Bros.' flour mill the other day to get some wheat, and got caught in the shafting. The screams of her companions attracted Mr. May's attention, and by promptly shutting down the mill, he saved the young lady from injury and probable death.

Another old pioneer lumberman has passed away in the person of Mr. Denis Gaudette, of Calabogie, who died on Monday evening last, at the advanced age of 78 years. Deceased was the father of Mr. Joseph Gaudette, of Armprior, and was known from Quebec to the head waters of the Madawaska, having for over forty years followed the occupation of lumbering. In his early days he carried on operations on the Jock River, getting out oak and elm timber, but in 1847 met with reverses owing to the flatness of the timber market at Quebec, and was obliged to retire from business. In 1848 he removed to Calabogie and began lumbering on the Madawaska and its tributaries. He was a native of the Province of Quebec, and was held in the highest of respect by the host of friends he made among all classes of people. He leaves a family of five sons and three daughters.—*Armprior Chronicle.*

A bonus is being raised to induce a company to operate the mill and elevator at Indian Head, N. W. T., which was formerly the property of the Qu'Appelle Valley Farming Co.

In reviewing the business of the country during the past year at the annual meeting of the Canadian Bank of Commerce, the other day, President Darling thus referred to the business of flour milling: The business of flour milling, in which we are largely interested, is frequently spoken of as being in a bad state, and undoubtedly it is not in a satisfactory condition. Very few of the small millers can apparently do more than hold their own, if they can do that. Our customers, however, are mainly millers in a large way, and have in almost every case been successful of late years. The margin of profit is indeed very small, but millers who make a large annual output, buying their wheat wisely and selling their flour in the Maritime Provinces, practically for cash, are always able to make a reasonable return upon their investment. The profits have averaged as well this last season as in recent years.

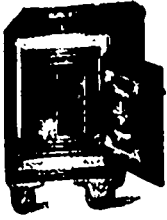
CHAMPION FIRE & BURGLAR PROOF SAFES.

WARRANTED THE STRONGEST AND BEST.

Prices 30 per cent. lower than any Safe made in the Dominion of as good finish. Send for circular and prices.

CHAMPION STUMP AND STONE EXTRACTOR.

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



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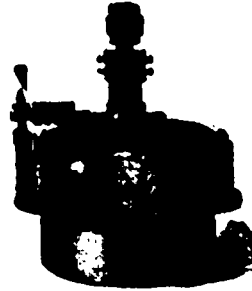
L. A. MORRISON, with A. R. WILLIAMS, General Agents, TORONTO, ONT.

"NEW AMERICAN" WATER WHEEL

Preferred by mill experts as the VERY BEST.

Was selected for driving the large Keewatin Mill.

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



E. P. CAVE, ROLLER MILL BUILDER, THISTLETON, ONT., writes: "She is a daisy," and "I will not fail to recommend it to any one in want of a Water Wheel."

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Manufacturers for Patentees in Canada.

THE DOMINION CHUCK AND TOOL WORKS

— MANUFACTURE —

Combination, Universal and Independent

LATHE CHUCKS

— AND —

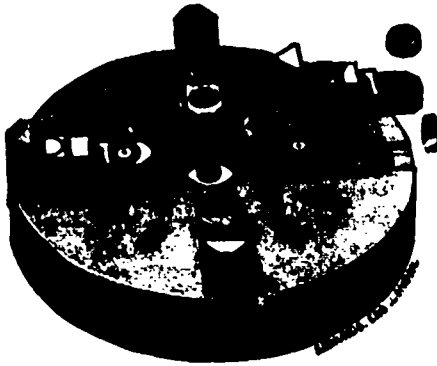
Wood Boring Machines

Of New and Improved Design.

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

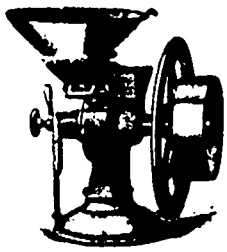
J. F. WALMSLEY,

WOODSTOCK, - ONT.



The Port Perry Feed Mill

BEST IN AMERICA.

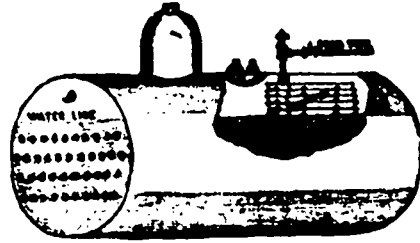


GRINDS all kinds of Grain equal to any pair of French Burr Mill stones, or any Roller Mill for the reduction of wheat to flour, or for fine corn to table meal, or corn and cobs to feed meal. Send for particulars.

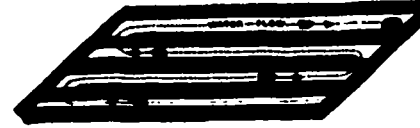
PAXTON TATE & CO., Founders and Machinists, PORT PERRY, ONT.

PATENT BOILER WATER PURIFIER.

No Purger Used!
Heat alone does it!



SHOWING POSITION OF PURIFIER IN BOILER.



SHOWING ONE OF THE PANS OF PURIFIER. FOR CIRCULARS WITH REFERENCES, PARTICULARS AND PRICES, ADDRESS

THIS PURIFIER ENTIRELY PREVENTS THE FORMATION OF SCALE UPON SHELL AND FLUES OF ANY BOILER IN WHICH IT IS USED. ALL IMPURITIES ARE EXTRACTED FROM THE WATER BEFORE IT REACHES THE WATER LINE, AND ARE DEPOSITED IN THE PANS OF THE PURIFIER.

THESE PANS CAN BE REMOVED, CLEANED AND REPLACED WITH VERY LITTLE TROUBLE, AND IN A VERY SHORT TIME, WITHOUT EMPTYING THE BOILER OF HOT WATER, WHICH MEANS A SAVING OF TIME LABOR AND FUEL.

J. W. HERMAN, 114 1/2 KING ST. WEST, TORONTO, ONT.

UNEXCELLED!

UNEQUALED!

UNRIVALED!

THE HERCULES Automatic Wheat Scourer and Separator

**THE ONLY WHEAT SCOURER
EVER AWARDED A GOLD MEDAL.**

**THE ONLY AUTOMATIC WHEAT SCOURER
EVER INVENTED.**

**THE ONLY WHEAT SCOURER
That Needs No Attention Whatever.**

THE HANDSOMEST AND MOST DURABLE MACHINE ON THE MARKET.

DUSTLESS

THE

HERCULES

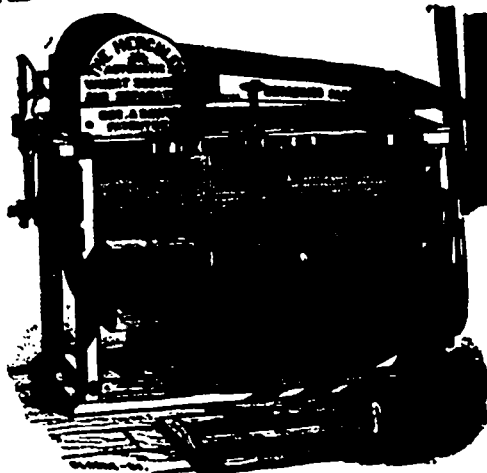
— HAS THE —

MAGNETIC ATTACHMENT

— FOR REMOVING —

METALLIC SUBSTANCES.

NO EXTRA CHARGE FOR SAME.



FIREPROOF

THE HERCULES

— IS —

WARRANTED

To Improve the Color of the Flour in any Mill.

IT WILL REMOVE

FOUR TIMES MORE FUZZ

THAN

ANY OTHER WHEAT SCOURER

WE ARE NOW READY, AFTER EXHAUSTIVE TESTS, TO PLACE UPON THE MARKET.

THE HERCULES DUSTLESS RECEIVING SEPARATOR,

THE HERCULES AUTOMATIC BUCKWHEAT SCOURER,

THE HERCULES AUTOMATIC CORN SCOURER.

SATISFACTION GIVEN OR NO PAY.

Write for Circulars, Prices and Guarantee on all the above machines. Address

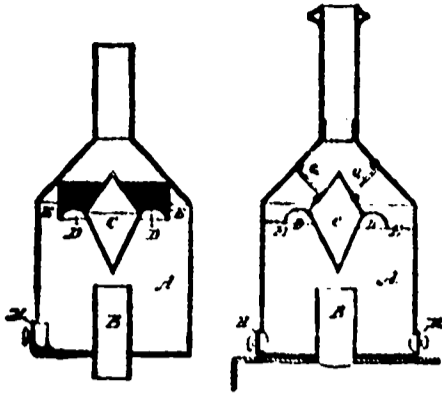
THE HERCULES MFG. COMPANY,
PETROLIA - ONTARIO.

**T
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Latest Canadian Patents.

Spark Arrester.

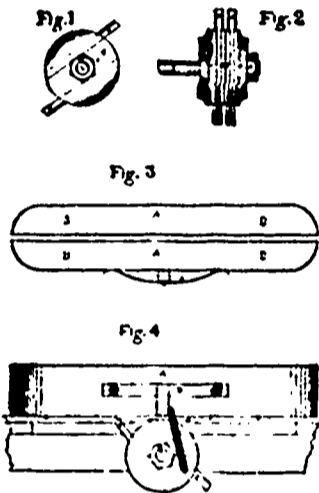
No. 28,810. William J. Ussery, LaSalette, Ont., dated 5th April, 1888.



Claim.—A spark-arrester for smoke stacks and pipes, consisting of a drum A, having a pipe section B entering through the bottom, and an outlet at the top, and two cones C united at their bases and provided with a downward flange D, projecting from said united bases, and a wire screen E or braces G, supporting said cones from the wall of the drum, whereby the cones will be directly above the smoke-section B, substantially as and for the purpose set forth.

Machine for Raising Panels for Doors, etc.

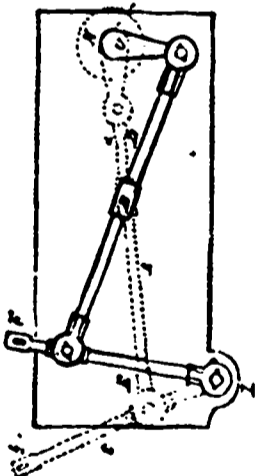
No. 28,844. George Dixon, St. Thomas, Ont., dated 10th April, 1888.



Claim.—1st. The combination of the cutters K, K and the collars c, c, c, substantially as and for the purposes hereinbefore set forth. 2nd. The combination of the bridge B and the guides a, a, substantially as and for the purposes hereinbefore set forth.

Shingle Feeding Gear for Shingle Machines.

No. 28,887. John I. Lloyd, Southwaterville, N. S., dated 13th April, 1888.



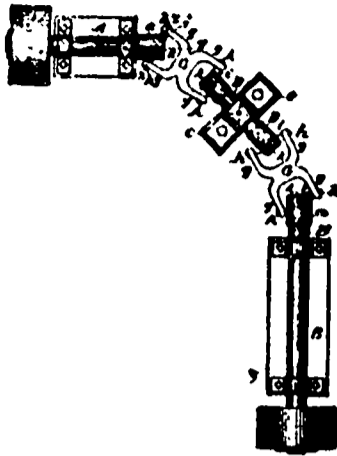
Claim.—An improved shingle feed, made with the crank C, connecting rod D, lever E, and pivoted fulcrum B, combined and operated as herein described and for the purposes hereinbefore set forth.

Universal Shaft Coupling.

No. 28,912. William A. Haskell, jr., Kingston, Ont., (assignee of Andrew Robes, Somerville, Mass., U. S.) dated 14th April, 1888.

Claim.—1st. The herein described universal shaft coupling consisting of an intermediate shaft supported in suitable bearings between two main shafts, and a pair of coupling-links of connecting-pieces provided with jaws at their opposite ends, and arranged one between the end of each main shaft, and the opposite end of the intermediate shaft, and connected with the ends of said shafts by means of a pair of oscillating bars, each pivoted at its centre within the slotted end of one of the said shafts, in line with the axis thereof, and having its opposite ends pivoted or journalled within the adjacent jaws of the coupling-link, substantially as and for the purpose set forth. 2nd. In a universal shaft coupling, the combination, with a pair of shafts A, B, each having a slot at its end, of an intermediate connecting-shaft D, supported in suitable bearings between the ends of the shafts A, B, and having a slot at each end, and a pair of coupling-links or connecting-pieces G, G, bifurcated at each end to form jaws g, g, and arranged one between each of the main shafts, and the adjacent end of the intermediate

shaft, and connected with said shafts by a pair of oscillating bars *i, i*, each pivoted at its centre on a pin *k* within the slotted end of one of the said shafts, in line with the axis thereof, and having its opposite ends pivoted or journalled within the adjacent jaws of the coupling-link, all operating substantially in the manner and for the purpose described. 3rd. In a universal shaft-coupling, the



combination, with a pair of shafts adapted to run at different angles, or levers, or both, and each having a slot at its extremity of a connecting piece or link G having its opposite ends bifurcated to form jaws, and a pair of oscillating bars *i, i*, each placed within the slotted end of one of the shafts and pivoted therein at the centre of its length directly in line with the axis of the shaft by means of a pin or bolt *k*, and having its opposite end pivoted or journalled within the adjacent jaws of the coupling piece or link G, all operating substantially as and for the purpose set forth.

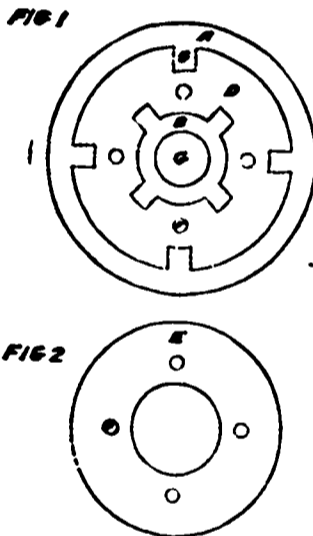
Process for Smelting Iron Ore.

No. 28,850. Thomas Rarrow, Montreal, Que., dated 10th April, 1888.

Claim.—A process of smelting iron ore by means of peat and mineral oil gas, substantially as described and for the purpose set forth.

Friction Gearing

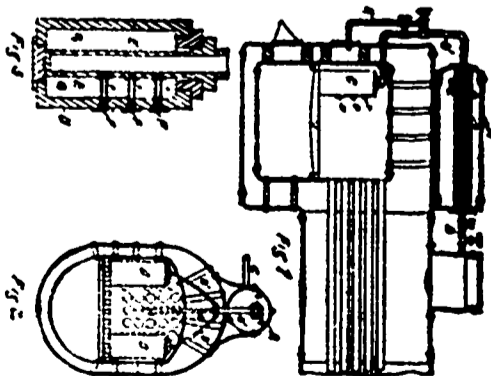
No. 28,908. James McMaugh and Arthur W. McMaugh, St. Catharines, Ont., dated 14th April, 1888.



Claim.—1st. The construction and combination of the outer rim or cylinder A and the inner rim or hub B, with lugs c, the hub or inner rim and outer rim or cylinder being independent of each other. 2nd. The filling of rubber or other elastic material D, between the inner rim or hub and outer rim or cylinder. 3rd. The plates for holding the rubber or other elastic filling in place substantially as and for the purpose hereinbefore set forth.

Apparatus for Saturating Steam with Hydro-Carburets, Generating Gas of Combustion and Effecting their Union in Furnaces.

No. 29,026. John Livingston, Toronto, Ont., dated 27th April, 1888.



Claim.—1st. The vessel A, as an apparatus for mixing steam with the vapours from oil, for having perforated pipes or plates, or perforated pipes and plates, in combination between the oil within the vessel and the outlet for the steam, as hereinbefore described and for the purpose specified. 2nd. The super-heaters D, having an outer casing and an inner perforated tube, with a space between filled with broken iron, and one or more nozzles F, as hereinbefore described and for the purpose specified. 3rd. The combination of the vessel A, used as mixer of steam and the vapours from oil, with the super-heaters D in a furnace, for the more perfect combustion of the fuel, as hereinbefore described and for the purpose specified.



Messrs. Wm. & J. G. Greey are supplying some additional Cockrell scouring cases to Messrs. Ogilvie & Co., of Montreal.

Mr. James Lister, of York Mills, has purchased a No. 0 Ureka snutter of Wm. & J. G. Greey, 2 Church street, Toronto, Ont.

Messrs. Ogilvie & Hutchinson, of Goderich, are putting in Cockrell scouring cases supplied by Wm. & J. G. Greey, of Toronto.

Messrs. Runciman Bros., of Goderich, millwrights and mill furnishers, have opened an office at 20 Main Street East, Hamilton, Ont.

George Higgins, of Southvale, is putting in a run of stones and Lefel water wheel. Wm. & J. G. Greey, of Toronto, have the order.

The Macfarlane Milling Co., of Sherbrooke, P.Q., have bought a flour feeder and mixer and two motion indicators of Wm. & J. G. Greey.

Messrs. Taylor, Stevenson & Co., of Chatham, Ont., are putting in a Welch wheat heater, supplied by Messrs. Wm. & J. G. Greey, of Toronto.

Messrs. Caddow & Robertson, of Williamsford, have placed their order with I. S. Runciman for a train of the Cochrane rolls and other machines.

The Cochrane Roller Mill Co. state that they are now running full blast and find it necessary to put on a night gang to keep pace with their orders.

Messrs. Runciman Bros. have entered into arrangements with O. P. Hurford, of Chicago, to manufacture the Hurford bolt for the Dominion of Canada.

Messrs. McLaren & Sons, of Renfrew, Ont., are enlarging the capacity of their mill. Wm. & J. G. Greey, of Toronto, have the order for rolls, dusters, etc.

Messrs. Runciman Bros. have completed a 75 bbl. full roller mill for N. G. E. J. McKechnie, of Durham, which is said to be giving first class satisfaction.

Mrs. C. Bonfield, of Eganville, has put in a new 24 inch Little Giant water wheel to drive her new roller mill. It was supplied by Wm. & J. G. Greey, of Toronto.

Messrs. W. Stablschmidt & Co., of Preston, are supplying Johann Faber, the great lead pencil manufacturing firm of Nuremberg, Germany, with a complete office outfit.

Messrs. Runciman Bros. are changing over the Otonabee mill in Peterboro, using the Cochrane train of rolls and a full line of round reels and centrifugals for 200 bbl. mill.

Mr. M. B. Burr Bloomfield, of Prince Edward Co., has placed his order with Messrs. Runciman Bros. for a full line of machines and machinery for a 75 bbl. mill, using the Cochrane roll.

Mr. Robt. Meek, Alton, Ont., is putting in one of Greey's improved No. 0 snut machines. His mill will soon be ready to run. It is fitted with the new style connected rolls and rope drive, all from the works of Messrs. Wm. & J. G. Greey, Toronto.

Wm. Ross & Sons, of Brussels, Ont., have ordered of Wm. & J. G. Greey, of Toronto, a full line of their new style connected rolls with rope drive, also purifier, dresser, scalpels and other supplies, and will fit up the old stone mill in the latest and most complete manner.

Messrs. Wm. & J. G. Greey have recently finished and started the following mills with their new style of connected rolls and rope drive, in every case, it is said, giving perfect satisfaction:—J. J. Minnis, Blytheswood, Ont., 50 bbls; McLellan Bros., Alton, Ont., 100 bbls; E. B. Hill, Linton, Ont., 25 bbls; Mrs. C. Bonfield, Eganville, Ont., 50 bbls.

While visiting the warehouse of the Canadian Rubber Company, Toronto, the other day, a representative of the MECHANICAL AND MILLING NEWS saw a full outfit of rubber belting which was about to be delivered for Messrs. Gooderham & Worts' new elevator in this city. Among the numerous belts was noticed one 14 inches wide and 460 feet long.

Saws for cutting the slits in gold pens revolve 4,000 times per minute.

The new C. P. R. workshops on False Creek, Vancouver, have been completed.

Mr. J. D. Barnett, of Port Hope, has been appointed mechanical superintendent of the new G. T. R. workshops at Stratford, Ont.

The Toronto branch of the Canadian Association of Stationary Engineers has elected the following officers for the ensuing year: President, A. M. Wickens; vice-president, W. L. Oathwaite; past president, G. Mooring; recording secretary, M. J. Wallbridge; financial secretary, Wm. Sutton; treasurer, G. White; conductor, M. Boyle; doorkeeper, P. Meyers; trustees, A. M. Wickens, G. Mooring and W. G. Blackgrove.

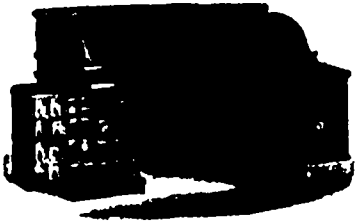
The Cochrane Roller Mill Supply Company, Dandas, Ont., have lately placed trains of rolls in the following mills: M. Deane's mill, Newmarket, capacity 200 barrels; W. Parlo's mill, Ingersoll, capacity 200 barrels; James Smith's mill, Ingersoll, capacity 75 barrels; Thomas Cook's mill, Carrville, Ont., capacity 50 barrels; Dobson & Campbell's mill, Heaverton, capacity 50 barrels; Thos. Geo. Hazlett's mill, Peterboro', Ont., capacity 200 barrels.

A correspondent details—not for publication—his experience with the "man who sells oil." This man had a "low gravity" oil for sale, and he was way up on that feature. As the oil was to be exposed to considerable heat, our correspondent was anxious to know its flashing point. A query to this end stuck the vendor of oil, but he was equal to the occasion. "The flashing point," said he, "has nothing to do with that oil, but I'll guarantee it has more low gravity to the gallon than any other oil on earth."—*American Machinist.*

W. Stahlschmidt & Co.

MANUFACTURERS OF

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Church and Lodge

FURNITURE

Preston, - Ontario.

SEND FOR CATALOGUE.

GEO. F. BOSTWICK,

Representative,

24 Front Street West, Toronto.

THE "DANDY."



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



C. W. ALLEN & CO.

"World" Building,

MELINDA ST. - TORONTO

WHOLESALE AGENTS—For the Province of Quebec: Wm. Ewing & Co., seed merchants, Montreal; for the Northwest, J. H. Ashdown, Winnipeg; for the Maritime Provinces, H. F. Coombs, St. John, N. B.



**CORPORATE SEALS, NOTARY SEALS,
SCHOOL SECTION SEALS,
COUNTY SEALS, LODGE SEALS,
SOCIETY SEALS, WAX SEALS.**

Send for prices and specimens of our Seals,
The H. BARNARD RUBBER STAMP WORKS

17 Hughson St. North,
HAMILTON, - ONT.

**PARKIN & CO.,
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.**

PATENT NO. 24,369,

Dated June 21st, 1886, for the manufacture of *Nodium and Potassium*, are prepared to grant licenses in Canada, or to negotiate for the sale of the Patent.

HENRY GRIST, Patent Agent.
OTTAWA.

MILLERS' AND MANUFACTURERS' INSURANCE COMPANY.

HEAD OFFICE,
24 Church Street, Toronto.

JAMES GOLDIE, Guelph, President.
W. H. HOWLAND, Toronto, Vice-President.

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OBJECTS.

To prevent by all possible means the occurrence of avoidable fires.

To obviate heavy losses from the fires that are unavoidable by the nature of the work done in mills and factories.

To reduce the cost of the insurance to the lowest point consistent with the safe conduct of the business.

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



London & Petrolia Barrel Co.

MANUFACTURERS OF
FLOUR, OATMEAL, OIL, VINEGAR, BEER AND OTHER BARRELS,

Flour Barrel Staves and Headings.

WORKS: Simcoe St. East, LONDON

All Work Guaranteed.

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PROCURES
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Prosecute and Defend Patent Causes in U.S. Courts.
PATENT BUSINESS EXCLUSIVELY.
Opinions given on Questions of Infringement.
Fees reasonable. Hand Book Free.
ROOMS 9, 10, 11 No. 94 GRISWOLD ST., opp. P. O.
DETROIT, MICH.

JONES' -:- SHORT -:- SYSTEM

THE LATEST AND BEST

FOR MERCHANT AND CUSTOM MILLS.

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

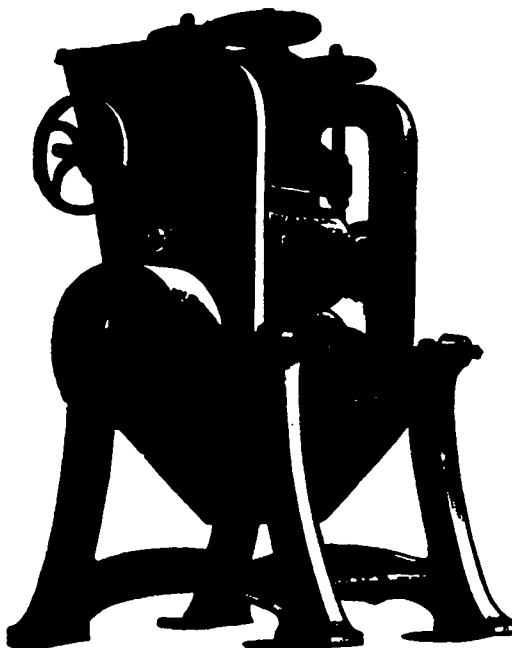
Our Purifier and Aspirator combined is the best machine we know of for the proper handling of middlings.

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

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

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

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



JONES' SHORT SYSTEM FOR CUSTOM MILLS.

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

CAPACITY—50 Barrels per Day from Fall Wheat.

TESTIMONIAL

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

ABINGDON, September 13th, 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.

GRINDING WHEAT BY ELECTRICITY.

THE *Electrical World* has published an illustrated description of a flouring mill at Laramie, Wyoming Territory, operated by Sprague electric motors. The capacity of the mill was 100 barrels daily. It is built of stone, three stories and basement high, and is equipped with steam heat and electric lights. The motors are used exclusively for power to run the mill, which has been in successful operation for two months. The system of milling is the "gradual reduction" process, and the yield and quality are equal to any in the States. The power is divided into units of 25 horse-power each. One motor drives all the purifying machinery, the wheat-cleaners and all the elevators and conveyors. The other motor runs the seven double sets of rolls and the flour packers. From the experience gained, Mr. Jones, the manager, states that he would advise mill-builders who use electric motors to subdivide their power into three units, by taking all wheat cleaning and scouring machinery and all elevators and conveyors running directly in their interest from the purifier line, and to apply a motor of proper capacity directly to them by means of a counter-shaft. He suggests this, owing to intermittent use of these machines. All the power is on the roller floor, one motor being belted up through one floor to the purifier line. He finds he has a lower percentage of loss of indicated power by having his engine in the mills instead of in a separate building, which would necessitate long shafting and belts. The substitution of three units for two would also afford another reduction in friction, as the cleaning machines could then remain idle much of the time, and less shafting and belting would be required. The motors are run at constant speed and are subject to little change, and that a slight and gradual increase in speed from time of starting until the day's run is complete. The increase is due to the variation in the temperature of the armature and is in about three proportions: At starting the roller line-shaft makes 210 revolutions per minute; at night the speed has increased to 224 revolutions. The motors are wound for 220 volts, but are run at 226 volts, and it requires in current an average of 150 amperes to drive the mill to its full capacity. A variation of pressure on these machines will vary the speed in about the same proportion as steam pressure will vary the speed of a steam-engine. A variation of one volt will produce the same effect on the motor as one pound of steam. It is easy to control the pressure to within one or two volts.

OVER-SPEEDED PLANING MACHINES.

THE strain upon the cylinder bolts, and the liability of the knives flying off in over-speeded planing machines, is not the only element of danger, says one of our American contemporaries. Over-speeded pulleys are just as liable to fly to pieces and do damage to the machine, as well as the operator. It is not practical to use pulleys on the cylinder shaft of less diameter than four and a half inches, as smaller ones soon destroy the belts.

Neither is it practical, as planing machines are constructed, to use pulleys on the back shaft of a greater diameter than twenty inches. Otherwise the back shaft would be too high to allow the matcher belts to run in their proper place. Now suppose the pulleys on the back shaft are twenty inches diameter, and four and a half inch face, which would be the right proportion for this purpose, with a rim averaging three-eighths of an inch thick. This pulley, in order to drive the cylinder 5,000 revolutions per minute, would require a speed of 1,125 revolutions per minute. Allowing the weight of the rim to be thirty pounds, which is about the average for pulleys of this size, the centrifugal strain by rules already given, would be as follows: The circumference in feet (5.2375), multiplied by the speed (1,125 revolutions), and divided by sixty, equals 98,202, the speed in feet per minute. The square of this number multiplied by the weight, and divided by thirty-two times the radius in feet, equals the centrifugal strain in pounds. The square of 98,202 = 8643,632. This multiplied by thirty and the product divided by 26.66, or thirty-two times the weight of the rim, gives 10851.79 pounds.

The rim of this pulley contains a sectional area of about one square inch, and the tensile strength of the best samples of cast iron, as determined by Major Wade, of the United States Ordnance department, is from 15,000 to 16,000 pounds to the square inch. It will be remembered, however, that those tests were made upon the basis of cast iron one inch square, and of different lengths, and from the best samples, perfectly sound and free from dirt or air holes, and it is a question whether the average castings obtained from the foundry from day to day will come anywhere near to this standard of strength.

Suppose every pulley was perfect and the iron up to the standard of strength, there is then only a margin of safety of 3810.40 pounds which is far below the standard of safety; for no piece of machinery in constant use and submitted to the same constant strain from day to day should be taken over its ultimate strength. Again, the shape of the material and the manner in which the strain is applied, has much to do with it. If the pulley rim instead of being a flat piece four and a half inches wide, and three-eighths of an inch thick, were put in the shape of a square bar, which would be about one inch square, it is reasonable to suppose that it would stand a much greater strain than in its present form, and in the manner in which the strain is applied. The same rule may be applied to this which is applied to beams and girders and it is necessary to state what every one knows that a cast iron beam four and a half inches wide and three-eighths of an inch thick will sustain more than four times the load when placed edgewise than it would if placed flatwise and there is but one conclusion that we can arrive at and that is that pulleys of the dimension given are not safe at such high speed. Aside from the question of safety there is also a question of economy involved that is worth consideration.

POINTS TO REMEMBER.

A GALLON of fresh water contains 231 cubic inches, and weighs 8¼ pounds (U. S. Standard.) A cubic foot of water contains 7½ gallons, or 1,728 inches, and weighs 62½ pounds.

The friction of water in pipes is as the square of the velocity. Doubling the diameter of a pipe increases its capacity four times.

To find the pressure in pounds per square inch of a column of water, multiply the height of the column in feet by 0.433. Approximately we generally call every foot elevation equal to ½ pound pressure per inch; this allows for ordinary friction.

In calculating horse-power of steam boilers, consider for:

Tubular boilers, 15 square feet of heating surface, equivalent to one horse-power, fire boilers, 12 square feet, equivalent to one horse-power; cylinder boilers, 10 square feet of heating surface, equivalent to one horse-power.

Each nominal horse-power of boilers requires 1 cubic foot of feed water per hour.

Consumption of fuel averages 7½ pounds of coal, or 15 pounds of dry pine wood, for every cubic foot of water evaporated.

Ordinary speed to run steam pumps, when the duty is not heavy, is 100 feet of piston travel per minute.

To find the quantity of water elevated in one minute, running at 100 feet of piston travel per minute. Square the diameter of water cylinders in inches and multiply by four. Example: Capacity of a 5-inch pump is desired. The square of the diameter (5 inches) is 25, which, multiplied by 4, gives 100, which is gallons per minute (approximately.)

To find the diameter of a pump cylinder to move a given quantity of water per minute (100 feet of piston travel being the speed), divide the number of gallons by 4, then extract the square root, and the product will be the diameter in inches.

To find the capacity of a cylinder in gallons. Multiplying the area in inches by the length of stroke in inches; divide this amount by 231 (which is the cubical contents of a gallon in inches), and product is the capacity in gallons.

The area of the steam piston, multiplied by the steam pressure, gives the total amount of pressure that can be exerted. The area of the water piston, multiplied by the pressure of water per square inch, gives the resistance. A margin must be made between the power and the resistance to move the pistons at the required speed—say 50 per cent.

GIVE THEM LIGHT.

WITH the return of warm weather, says the *Roller Mill*, come the perennial complaints about bugs in the bolting chests, coupled with anxious inquiries after some effective way to get rid of the little pests. The usual prescription is any good insect powder, preferably one not poisonous to human beings, to be run into the infested reels, or sprinkled upon the cloth when the mill is not running, repeating the dose until the bugs have all been killed or driven out of the machine. The objections to such a remedy are that it renders a considerable quantity of stock unfit for flour, and that it is not permanent but must be resorted to at more or less frequent intervals in every mill in which the "demd bugs" have effected a lodging. In other words, insect powder is local, not radical, in its operation.

In view of this discouraging truth, it gives us pleasure

to recommend, on the authority of an experienced miller a simple and inexpensive method, said to be prompt and lasting in its effects. It is based on the ascertained fact that bolting cloth bugs like evil-doers of a certain two-legged race are accustomed to operate in the dark, and will at once quit work and "light out" when anybody lets the light in upon them. Here it is: Cut out the panels on the side, or, better, both sides, of the chest, and fasten tightly across the openings pieces of canvas thin enough to allow the passage of a pretty strong light. This cure our informant says he first tried in a bug-bothered mill of which he had just taken charge, with the result that in a few days the reels throughout the mill were entirely and permanently depopulated.



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

A workman in the Carson mint has discovered that drill points, heated to a cherry red and tempered by being driven into a bar of lead, will bore through the hardest steel or plate-glass without perceptibly blunting.

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

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

DEVICES FOR STRETCHING EMERY CLOTH.—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 "file," 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.

The frequency of conflagration caused by electric light wires induced the Electric Club of Philadelphia to inquire into the means of preventing them. At a recent meeting the various automatic cut-outs proposed by different inventors were considered, some utilizing the heating of a wire, some the action of a spring pulling against an armature of a magnet. The old arrangement of a fusible alloy cut-off was pronounced objectionable on account of interruption produced when it melted, but this was obviated by an arrangement for throwing other fusible pieces into the circuit one after the other. Thus a momentary increase of current would only cause a momentary stoppage. It was evident that there is a good field for inventors here, in devising an efficient safeguard against too strong currents that may accidentally be thrown upon a wire unable to carry them without heating.—*Scientific American*.

Following is a brief summary of the tests for the cast iron devised and practiced successfully by W. J. Keep, of Detroit, Mich.: When the tests are carried out in their entirety 15 pounds of metal are melted in a plumbago crucible in a firebrick furnace driven by a blast at a pressure of 1.5 ounces per square inch. Three sets of test bars are run from each melting. One bar is .5 inch square and is cast with the ends against a chill exactly 12.125 inches apart. Another bar is cast with this and is run from the same gate. It is one inch wide and .1 inch thick and is run against chills in the same way as the square bar. When the bars have been trimmed and both bars and chills have attained the same temperature, the sinkage is measured by inserting a graduated wedge between the end of each bar and its chill. A third bar is called the fluid strip. The pattern of this is one inch wide, 12 inches long and .05 inch in thickness. This is run from the end and is poured first. The strip rarely runs full, and its length in inches is taken as a measure of the fluidity of the metal. The fourth bar is called the crook strip. It is 12 inches long, 1 inch wide and .086 inch in thickness. On the centre of one side there is a rib .412 inch high, .2 inch wide at the base and .1 inch wide at the top. The unequal shrinkage of the thin flat strip and of the taper rib causes a slight curve in the test piece. This when measured affords valuable information as to the properties of the iron and is called the "crook." The first and second bars are tested for transverse strength and resistance to impact. The first test is made by a gradually applied weight, the deflection being measured at the same time. The resistance test is made by subjecting the bars to a series of blows from a 25-pound weight until it breaks, the fall being at first .5 inch and increasing .125 inch at a time. An arbitrary scale has been constructed giving a value in pounds avoirdupois on an assured valve for a foot-pound. After these tests have been made the depth of chill is determined, and the grain of the fracture is observed by means of a pair of lenses. The hardness of the metal is finally tested by means of Turner's machine, in which a polished surface is set under a diamond of a standard cut, and the diamond is weighted until it produces a scratch similar to a standard scratch.

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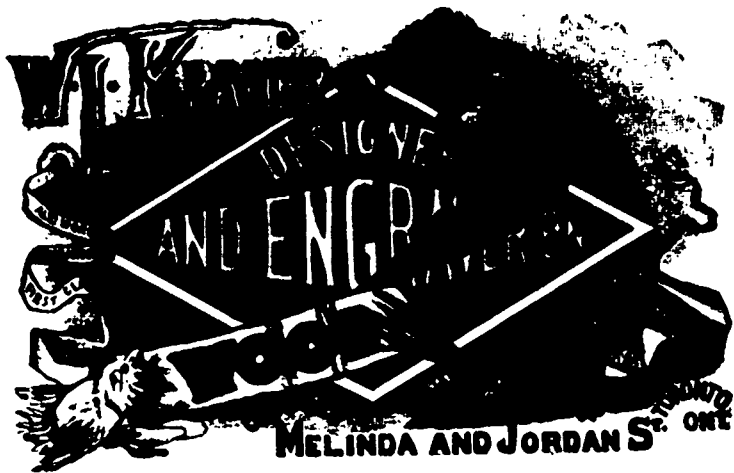
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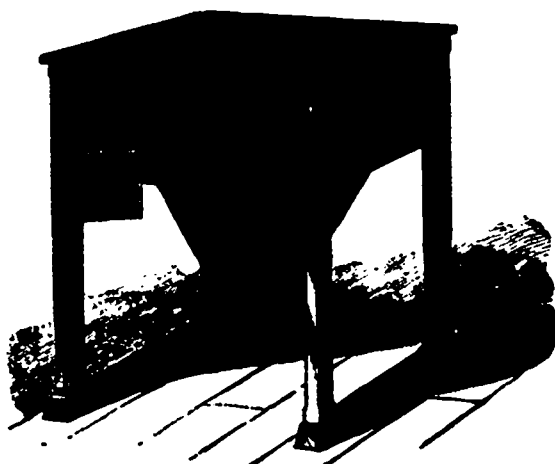
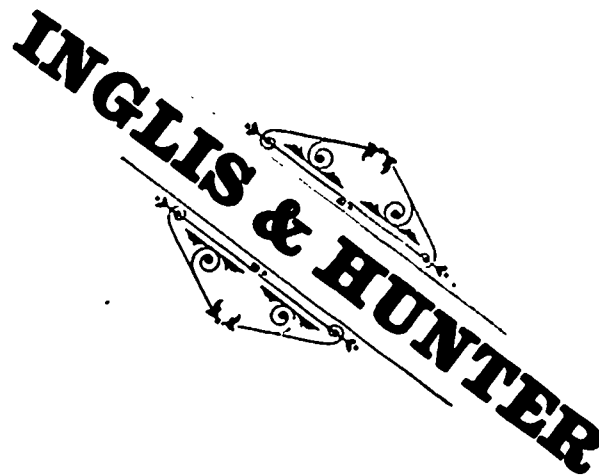
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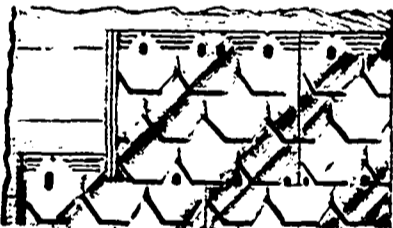
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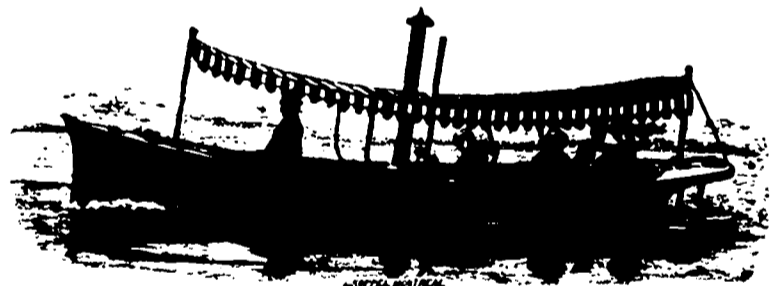
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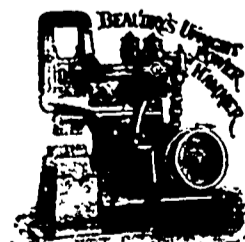
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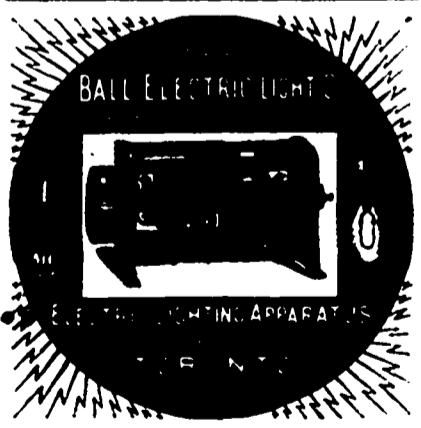
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